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Telephone : WHItehall 9233 (12 lines) *Telegrams : "Trazette Parl, London"*

BRANCH OFFICES
GLASGOW: 87, Union Street . . . . . *Central 4646*
NEWCASTLE-ON-TYNE: 21, Mosley Street . . *Newcastle-on-Tyne 22239*
MANCHESTER: Century House, St. Peter's Square . . . *Central 3101*
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . *Edgbaston 2466*
LEEDS : 70, Albion Street . . . . . *Leeds 27174*
BRISTOL: 8, Upper Berkeley Place, Clifton

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Another Fares Revision

THE revision of fares at the end of this month—the fourth affecting British Railways this year—annuls the standstill order of April 15 by which the then Minister of Transport, Mr. J. S. Maclay, vetoed the increases in British Railways fares outside the London Area envisaged in the Passenger Charges Scheme, 1952, and due to take effect from May 1. The decrease in ordinary single fares from that date, provided for in the scheme, was allowed to take place. The latest revision also gives effect to a House of Commons' resolution on April 28 against "disproportionate" increases in certain fares outside the London Area and in favour of applying the same principles, in the matter of what is disproportionate, to fare increases effective from March 2 on British Railways within the London Area and on London Transport railway and road services. Examples of the resultant increases and decreases are given elsewhere in this issue. The principal changes are the increases in season ticket rates and workmen's (to be called "early morning return") fares outside London; the decreases within the London Area are not general, and most fares in London will remain unchanged. The standstill order was a hurried measure by the Cabinet to assuage public indignation expressed at the fare increases in March and impending from May. This indignation might have been less if the increases had been more skilfully presented to the travelling public. The latest alterations are in some degree a concession to Londoners who objected to paying, from March onwards, fares proportionately higher than in the provinces; but it would have been further folly not to have sanctioned the season ticket rate increases outside London. The resultant loss of revenue through all these changes has been admitted by the present Minister, Mr. A. T. Lennox-Boyd, to be some £1,900,000 in a full year. This is a heavy price to pay for ill-advised Government intervention. The whole episode is an example of the undesirability of political intervention in matters that should be kept outside the sphere of politics; but had British Railways and London Transport been free to fix their own charges, it is unlikely that the commotion, which was largely the result of the rigidity of the charges schemes propounded and presented by the British Transport Commission, ever would have arisen.

Bridge and Structural Engineering Congress

THE International Association for Bridge & Structural Engineering is holding its Fourth Congress from August 25 to September 5 in Cambridge and London. Fifty-three papers have been submitted for discussion, covering almost every aspect of the subject, from reports on the testing of models to detailed descriptions of new and rebuilt structures. The Association was founded at Zurich in 1929 to promote "the interchange of knowledge, ideas and the results of research work in the sphere of bridge and structural engineering" whatever the material used for construction. The Permanent Committee meets once a year and the aim is to hold a Congress in different countries every four years, though the continuity was interrupted by the war. Previous Congresses have been held in Paris (1932), Berlin (1937), and Liège (1948). The Congress has the support of the Institution of Civil Engineers, the Institution of Municipal Engineers, the Institution of Structural Engineers, and the Royal Institute of British Architects. The President of the Congress is Lord Woolton, Lord President of the Council, and the six Vice-Presidents include Mr. Allen S. Quartermaine, President of the Institution of Civil Engineers and formerly Chief Engineer, Great Western Railway, and of the Western Region of British Railways.

German-built Coaches for Australia

A FALSE impression created by statements in the national press that Germany is building eighteen coaches for use as a Royal train in Australia has been dispelled by Sir Archibald J. Boyd, Chairman of the Railway Carriage & Wagon Building Association, in a letter to one of the newspapers concerned. As Sir Archibald Boyd has said, the coaches, which are air-conditioned, are to provide more comfortable travel for ordinary passengers on the Trans-Australian line of the Commonwealth Railways on which traffic has increased considerably. When enough diesel-electric locomotives are delivered, the service between Kalgoorlie, Western Australia, and Port Pirie, South Australia, will be accelerated. Tenders for the coaches were called some two years ago, but British builders were already too heavily committed and were reluctantly unable to tender. The order was placed with Wegmann & Co., of Kassel, Germany, through its Australian agents, and is being carried out by that firm and by other German manufacturers in association; in any case it could not have been completed in time for the Royal tour, which was planned for the early part of this year. The stock, which includes restaurant, sleeping and lounge cars, and brakevans, is now being loaded on the ss. *Christen Smith* at Bremen.

Overseas Railway Traffics

INCREASES in Antofagasta (Chili) & Bolivia traffics have recently been at a considerably smaller rate than in the first six months of this year. During the fortnight ended August 8 there was an improvement by £10,780 to £269,310, to which the first week contributed only £1,570 at £143,160. There have been few setbacks in receipts for the 32 weeks since January 1 and the aggregate result is £1,092,010 better at £4,871,900. Victorian Railways traffics for April amounted to £2,010,674, as compared with £1,793,401 for the same month last year. The £217,273 improvement was largely accounted for by a £216,508 advance in railways receipts, though electric street railways and road motors also contributed. Rising traffics have continued on the South African Railways and at July 12 the aggregate improvement amounted to £1,349,561 at £29,179,537, for the 15 weeks since April 1.

More Passenger Trains—Not Less

MANY American railway officers regard passenger trains as money-losers, to be eliminated as far as the various state commissions and the Interstate Commerce Commission will permit. Recently Mr. Frederic C. Dumaine Jr., President of the New York New Haven & Hartford Railroad, expressed precisely the opposite view. "Discontinuing passenger trains," he said, "is no solution of the problem, because that cuts out revenue. Without trains, how can a railroad earn any revenue? It is terminal expenses—the sum total of all terminals, big and little—that are the big burden." He went on to point out that with every addition to the train service, unit overhead costs can be reduced, and there is increasing opportunity of showing a profit. While his company had taken off a few lightly-patronised trains, every fresh issue of its timetables showed increases elsewhere in the passenger services. With the last issue, for example, new diesel-hydraulic railcars of the popular "RDC" type, christened "Shoreliners," had been introduced, following the general trend towards increased mileage and utilisation of crews and equipment. His company is exceptionally fortunate, however, in the dense population of the area that it serves, which favours maximum use of the trains.

Additional Rolling Stock for Nigeria

THE Nigerian Railway is now taking delivery of seven sleeping cars, recently completed by Cravens Railway Carriage & Wagon Co. Ltd., which are described and illustrated elsewhere in this issue. Completion of the new rolling stock further implements the programme, outlined in our January 13, 1950, issue, of new construction for the Nigerian Railway, required to cope with increasing traffic. Previous rolling stock completed for the programme was described and illustrated in our January 13, 1950, and January 5, 1951, issues. The latest stock consists of four first class and three first and second class composite day and night sleeping cars. A feature of the design of the first class and first class compartments of the composite stock is the inclusion of a shower in the toilet arrangements, an amenity which will be much appreciated by long-distance passengers. A considerable degree of standardisation has been accomplished in both types of cars, a common underframe and bogie being fitted. The cars are also similar in exterior appearance.

Railcars in Greece

FEW countries recently have shown such an advance in the amenities of railway travel as Greece. Pre-war journeys, by steam train to the extent of 90 per cent., were slow and hot, and not particularly clean. But the gradual post-war rehabilitation has been marked not only by new bridges and track but by railcars and diesel trains, worked singly, in sets, or with trailers. Speed of travel has not been increased thereby to mile-a-minute levels; the routes are not suitable for that, whatever the motive power. But every line open has railcar services except the section between Nea Orestias and Svilengrad, where the trains are international only. The Piraeus-Athens-Salonica trunk route has a through railcar in each direction daily, covering the 324 miles in 10 hr. 16 min. down including 13 intermediate stops, and in 10 hr. 30 min. up. This service normally is operated by triple-car trains. Other cars run over the southern end of this route as far as Larissa; and over the northern end from Salonica to Plati, *en route* for Florina. The rambling 275-mile line from Salonica to Alexandropolis (Dedeagatch) also has through railcars, and others over intermediate lengths. Also, the three Greek private lines now have something approaching 100 per cent. passenger working by railcars.

U.S.A. Diesel-Electric Expansion

DURING one week in June orders were placed by eleven American railways for 213 additional diesel-electric locomotive units, at a total estimated cost of over $33,333,000. In the earlier months of 1952, some of the orders put out by individual railways were almost up to this total, such as 188 units ordered in March by the Southern Pacific; 90 were ordered also by the Chicago & North Western, 60 by the Santa Fe, and 59 by the Louisville & Nashville. So the process of expanding the U.S.A. diesel fleets goes on unceasingly. A significant statement was made recently by President Wayne A. Johnston, of the Illinois Central System, which hitherto has been the only major system (except the Norfolk & Western) to confine its diesel working almost exclusively to streamline passenger trains. At the annual stockholders' meeting in Chicago he remarked that the savings from the experimental substitution of diesel for steam power between Mattoon, Illinois, and Evansville, Indiana, had been "more than we anticipated," and he foreshadowed a changeover by the I.C. from steam to diesel power between Meridian, Mississippi, and Shreveport, Louisiana, as well as on all its lines west of Chicago.

Too Fast Through a Crossover

WE reproduce in summary in this issue Colonel D. McMullen's report on the derailment at Polesworth on November 19, 1951. This was one of those cases occurring from time to time where a crossover junction is taken at excessive speed. Colonel McMullen is convinced that the driver did not see the distant signal at all, and stresses the advantage of applying warning automatic train control to such signals generally. He refers to other accidents, derailments, and collisions, which almost certainly would have been prevented had such apparatus been in operation; between them these cases accounted for 94 fatalities. We agree with him that it is greatly to be hoped that the production of a system suitable for use throughout British Railways will not be long delayed. It can be only regarded as great good fortune that this derailment was not attended with a heavy list of serious casualties, but doubtless the situation was saved, as Colonel McMullen points out, by the presence of the platform. As it was, only two injuries to passengers fell to be recorded, out of a load of 174, a remarkable circumstance.

Motive Power in Java

THERE is always interest in observing how improvements in locomotive design and construction, for example, better valves and valve motion, and boiler proportions, have so enhanced performance that special types of locomotives have come to be regarded as less necessary than formerly. The predecessors of the Indonesian State Railways, for instance, for many years used 2-6-6-0 Mallet tank engines of 62 and 57 tons weight and of compound propulsion, some score of 75-ton 2-12-2 tank locomotives, limited respectively to 9, 9½ and 10½ tons maximum axle load. These locomotives operated in Java, where the 100 new 2-8-2 engines described elsewhere in this issue are being worked; but since the introduction 40 years ago of the special machines, strengthening of most lines has been effected, so that 12¾-ton axle loads are permitted over most routes and even 13½ tons over a more restricted mileage.

As long ago as 1915 trains at start-to-stop speeds above 40 m.p.h. were being run by Swiss-built Pacifics; and in the 1930s Java for a period boasted the fastest trains on 3 ft. 6 in. gauge systems, up to 47-48 m.p.h. start-to-stop, and hauled generally by 4-6-2 or 4-6-4 tank engines. Speeds have not yet re-attained these levels, and the recent 2-8-2 two-cylinder locomotives, though permitted to run up to 56 m.p.h., are likely to be concentrated for some time to come on heavier trains and slower schedules.

Holiday Travel Without Tears

MANY parents at this season may well envy the type of holiday travel depicted week by week in their children's comic papers. Timetables and inquiry offices are superfluous when the first train to arrive is invariably and correctly greeted with a confident cry of "here is the train to the seaside!" The fact that there is only one resort on the system avoids confusion among travellers at the same time as it simplifies the work of the operating department. These conditions, coupled with the fact that no luggage except a bucket, spade, and shrimping net is required for a fortnight's holiday, may be considered a fair exchange for the inconvenience of having to share a compartment with a hippopotamus reading *The Times*, two giraffes, and a polar bear licking an ice cream cornet. There may, therefore, be an understanding undercurrent of relief in the shout of "here is the sea *at last*" with which the first appearance of the coastline is greeted, but irritations are soon forgotten amid the comprehensive pleasures of the resort, where every attraction is fused into a whole that outstrips the imagination of the most exuberant railway poster artist.

The South African Railways in 1951

THE difficulties which face the South African Railways, short of staff and materials, in meeting the great industrial expansion of the country are brought out in the report for the calendar year ended December 31, 1951. The S.A.R. was criticised for contributing to the acute coal shortages during the winter of 1951, but the report points out that the Administration had no say in the allocation of coal, which it merely conveyed.

Goods traffic increased from 39,665,564 tons in 1940-41 to 62,133,709 tons in 1950-51, or 56·6 per cent. Wagon loadings increased by 33·9 per cent. from 3,886,468 to 5,203,773, and train and locomotive mileages by 29·5 per cent. from 83,285,203 to 107,836,153. Efforts to meet transport requirements were hampered by the go-slow strike among railway artisans, which coincided with the closing of schools and the winter season passenger rush, and at a time when the demand for coal is at its highest; and the effects of a severe drought and winter.

Rolling stock in service during the year amounted to 2,462 steam locomotives, 218 electric locomotives, 5,579 coaches, 48,707 bogie wagons, and 32,800 four-wheel wagons. Twelve locomotives, 250 coaches, 1,804 bogie wagons and 1,065 four-wheel wagons were placed in service. At December 31, 1951, rolling stock on order totalled 370 steam locomotives, 120 electric locomotives, 156 motor coaches, 620 coaches, 10 steam travelling cranes, and 8,336 wagons.

Forty-one road motor services covering 760 miles, were introduced, and 26 services, with a route mileage of 551, were withdrawn. The number of passengers conveyed by road increased from 14,978,183 in 1950, to 15,770,049. Goods traffic by road amounted to 1,937,299 tons, an increase of 143,804 tons.

In surveying the activities of the harbour and shipping services, the Board records that 12,692,757 tons of export and import traffic were handled at the major harbours, compared with 11,864,886 tons during 1950. The operation of harbour services during the year resulted in a surplus of £2,691,629, and that of the shipping services one of £122,496. Passenger mileage by South African Airways, both internal and trunk services, increased from 124,633,418 in 1950 to 135,630,457 in 1951.

The operation of all services during the year under review was financially a considerable improvement, and ended in surplus of £8,586,123. This improvement was largely the result of improved receipts from goods, passenger and coal traffic, road motor services and interest on investments, while harbour and airway revenue also rose. The economy campaign brought considerable savings. Construction of new lines and new works made good progress. On June 13, 1951, the line between Grootvlei and Redan was opened to all traffic, and the Springs-Welgedacht line was opened for the conveyance of goods traffic on December 21, 1951. The construction of the Oogies-Broodsnydersplaats line was completed during the year, as also the Whites-Odendaalsrus line, which still, however, required the provision of signalling, locomotive water supplies and road bridges. The line from Odendaalsrus to Allanridge was still under construction at the end of the year.

Rail-End Defects

OF all steel rail defects, probably the most difficult to detect are those which occur at the rail-ends and are concealed by the fishplates. For various reasons, the end of a rail is particularly susceptible to defect development. This may result, in the case of top rails from ingots, from piping or segregation. But the major cause is the pounding and vibration to which rail-ends are subject because of the gap between the rails over which the rolling load must pass. This may encourage the development of corrosion fatigue cracks from any sharp edges, such as those of the fishbolt holes or in the fishing angles of the rails, where stresses are concentrated. The trouble is accentuated if the packing up of the joints is below the normal standard—as, for example, in tunnels, where track maintenance inevitably is more difficult than out in the open—because of the pumping up and down of the joint and the consequent increase in rail-end stresses.

Cracks which have started on a very small scale from fishbolt holes or in the fishing angles of rail-ends in this way tend to grow, and may be extended considerably when exceptional stresses develop, such as those resulting from excessive locomotive hammer-blow or flat wheels; moreover, like the transverse fissure, they can develop to such a degree as eventually to cause a fractured rail. In the course of ordinary inspection, the only way to discover whether or not a rail is cracked at the end is to take off the fishplates, and in some tunnels this is a regular procedure, but the unscrewing and rescrewing of the fishbolts makes it a costly operation from the labour point of view.

In the United States certain railways are now supplementing the regular patrolling of their tracks with Sperry or other detector cars (for the detection of transverse fissures), by supersonic testing of rail-ends. Two forms of such testing are in use, the Sperry Ultrasonic detector car, which, as its name implies, is a vehicle running along the track, and the Branson Audigage flaw detector, which is a hand instrument. The former runs on four wheels and is of about the same dimensions as a surfacemen's trolley; the latter is a very small appliance running along the railhead, and manipulated by a long handle which enables the operator to walk upright along the track, with the electrical gear strapped to his back and headphones to enable him to hear the amplified defect responses from the rails. To date, 42 railways have about 130 Audigage detectors in use, one line to a total of 28. In addition to the inspections of rail-ends in open track, they are being used on rails of which the web and feet are completely buried in highway crossings, and on rails in switch and crossing work.

Some details of results achieved with Audigage detectors were given recently in *Railway Engineering & Maintenance* by Mr. C. J. Code, Engineer of Tests, Maintenance of Way, Pennsylvania Railroad, which has 13 of these detectors in use and two more on order. During 1951, 89,700 rail-joints were tested, and 3,400 defects were located, resulting in the removal from the track of 1,487

rails. Also, the rails of 5,444 highway crossings were tested, and 417 defective rails were removed from them. Another railway in the eastern states of the U.S.A. in the first six months of 1951 tested 72,000 joints on two regions of its system, locating 2,444 failures, of which 1,008 started from bolt-holes and 1,429 from the upper fishing angle of the rails. A major railway in the western states tested 717,000 joints, and as a result removed 684 rails from the track, 266 as a result of bolt-hole cracks, and 418 with separations between the head and web of the rails. In the two latter cases both Audigage hand detectors and Sperry Ultrasonic detector cars were in use.

One of the problems arising from such inspections has been to decide at what stage of development a crack becomes sufficiently serious to demand the removal of the rail from the track. To remove all rails in which small cracks are found would appear to be an unjustifiably costly proceeding. At present there is general agreement that head-and-web cracks less than 1 in. long and bolt-hole cracks less than ¼ in. long may be left in the track without appreciable risk.

On certain lengths of track the Pennsylvania Railroad has conducted tests to obtain information on this point. In one such test, 200 joints in 152-lb. rail were tested in January, 1951; long cracks were found in 10 rails, which were removed, but 35 rails with cracks less than 1 in. long were left in the road. In testing the same 200 joints again in November, 1951, it was found that one of the short cracks had grown to 7 in., but that no new cracks had developed. At another location, where 208 joints in 152-lb. rail were tested, long cracks were found in three rails, which were removed, and short cracks in 26 rails which were left in. At a re-test in November, two 1-in. cracks had grown to 8 in., but the remainder were unchanged in length; between the two tests, however, there was a service failure of a rail which had been sound at the first test.

The present practice of classifying the cracks and removing from the track only rails that have cracks of over a certain length, would appear to be reasonably safe, and far less costly than the indiscriminate removal of all rails showing the slightest sign of cracking; but it might well be reinforced by more frequent testing, and by a permanent record of all rails that have been left in the track with short cracks.

Trans-Zambesia Railway

THE report for the year ended December 31, 1951, of the Trans-Zambesia Railway Co. Ltd., of which Mr. Vivian L. Oury is Chairman, shows that after taking into account interest on investments and adjustment of taxation provisions and reserves, and providing for taxation on current profits, tax equalisation reserve, and reserve for increased cost of replacement of fixed assets, the surplus available for distribution was £70,542, compared with £58,023 for 1950. After meeting the service of the 3½ per cent. first debenture stock, £18,750 was available for interest on the £1,500,000 5 per cent. income debenture stock. The provision for renewals at £39,434 is some £1,000 greater than last year, and a further sum of £30,630 has been transferred to reserve for increased cost of replacement of assets.

The following are some of the principal results:—

	1950	1951
Goods tonnage	281,240	325,943
Passenger journeys	141,183	178,486
	£	£
Goods receipts	422,708	424,892
Livestock and vehicle receipts	6,304	6,078
Passenger receipts	73,406	91,398
Luggage and parcels receipts	9,829	10,562
Gross receipts	518,290	538,750
Working expenses	334,236	380,511

The increase in passenger traffic was caused largely by increased travel by Africans, resulting in a rise of 24 per cent. in receipts. Goods tonnage rose nearly 16 per cent. The increase in receipts, however, was more than overtaken by higher working costs, and the report states that the Board is considering increasing charges, which are still the same as prewar. Early delivery was expected of the two additional "G" class locomotives ordered last year, and also two first class passenger coaches. In addition, orders were placed for a further 60 open wagons, delivery of which was promised during the first half of 1953. These additional wagons are required chiefly to carry the rising output of coal from the Moatize Mine. Further progress was made with the improvements to track, and work on the erection of staff houses and the new hospital at Inhaminga was pushed ahead. As a result of exceptionally heavy rains in February last, the level of the Zambesi River rose to a peak of 143 ft. 6 in. at Dona Ana, where the Lower Zambesi Bridge crosses the river 18 in. higher than the previous record level in 1918. The Sena-Caia section, near the south bank of the river, was constantly patrolled and, as a precaution, traffic on that section was restricted to the hours of daylight for four days.

To facilitate increased through traffics between Nyasaland and the Rhodesias, the T.Z.R. is co-operating with the Caminho de Ferro da Beira in the provision of additional sidings at Dondo Junction so that trains for Rhodesia can be marshalled at that point: this will avoid the haul into Beira and back, a saving of 36 miles. The tonnage handled at the port of Beira during 1951—2,355,872 tons—set up a fresh record and is an increase of 15 per cent. over the previous year. Although in the early part of the current year the port was temporarily congested, the tonnages handled in the first four months show an increase of nearly 14 per cent. compared with the same period of 1951. The handling of traffic in the port is being further expedited by the completion of the new mineral and oil wharf extensions, and two more deep-water berths are to be constructed. The report refers to another major project being undertaken by the Portuguese authorities in Mozambique, the construction of a railway linking Southern Rhodesia with the port of Lourenço Marques.

Modern British Bridging Practice

AS we pointed out at the time, British military railway bridging design and practice was in the forefront during the war and was standardised by the Allies. Now in peacetime it is also clear that British Railways engineers are keeping well in the van of civil bridging, as exemplified in the latest Western Region practice described elsewhere in this issue. Obviously, no pains have been spared to produce a type of through plate-girder bridge, which at once can be erected simply with a minimum delay to traffic working, and requires the least possible maintenance. These results have been achieved mainly by the adoption of a system of high-tensile bolting to secure units of the decking when lowered by crane to fit between the tapered faces of the stiffeners of the all-welded main girders. The units combine the cross-girders, stringers and deck, and no site-riveting or concreting is necessary before opening to traffic. This simplification in fieldwork has, however, entailed much ingenuity in planning. The fixing moments on the cross-girders, and the maximum resistance to corrosion are subjects that have been carefully studied in this design.

A high degree of accuracy in welded fabrication was called for, especially in the fitting of the cross girders to the sloping stiffeners; the fact that these surfaces made good contact without resort to machining testifies to the sound workmanship of the makers. It was highly desirable that the precast reinforced concrete units embodying the cross girders and stringers should be assembled for trial in the girderwork at the makers' works before the span was accepted for despatch to site for erection. That the fabricators were themselves able to undertake the concrete work added in no small measure to the successful production of this new form of bridge. Incidentally, the works at Chepstow where these bridges were made were originally laid down by Finch & Willey Limited for the construction of Brunel's famous railway bridge over the Wye, the centenary of which took place in July this year. The works were taken over by the Fairfield Shipbuilding & Engineering Co., Ltd., in 1925.

U.S.A. Railway Passenger Traffic

(By a Correspondent)

AN article in our issue of August 1 described the enterprise of the Great Northern Railway in providing new streamliners for an accelerated service between Chicago and Seattle. These trains take their name from James J. Hill, who created the railway and also controlled the Northern Pacific and the Burlington system about 50 years ago. He was known as the "Empire Builder" because his lines developed wide stretches of uncharted land in the western regions of the United States. There is a shade of irony about the nomenclature because Hill did not value passenger trains highly. What he set store by was the ton-mileage turned out by freight trains. Traffic trends over the last 30 years prove that Hill judged the future scope of rail transport correctly. Between 1920 and 1951 passenger-miles on the U.S.A. railways declined from 46,489 million to 34,615 million, or by 26 per cent.; over the same period revenue ton-miles increased from 410,306 million to 646,606 million, or by 57 per cent. If the Korean war had not stimulated passenger travel from October, 1950, onwards, the chances are that 1951 passenger-miles would have been below the poor 1950 total of 31,760 million, and not 9 per cent. above it.

This is the third time in 40 years that war has checked the downward trend of passenger-miles. The impact of the first world war established new records for passenger carryings each year from 1916 to 1920. By 1933 business dwindled to little more than a third of the 1920 volume. A slow and partial recovery until 1940 was inflated as soon as Pearl Harbour brought America into the second world war. The number of railway passenger journeys did not approach the record heights of the 1916-1920 period, but the average passenger journey on individual railways lengthened to 105 miles in 1944, when passenger-miles struck the all-time high of 95,549 million.

On the return of peace, the Association of American Railroads set up a committee to make an economic study of transport prospects. The committee estimated that from 1947 to 1950 passenger-miles would decrease by 30 per cent. Though the railways spent large sums on improving passenger facilities during these years, the forecast proved to be right. Last year, owing largely to the expanded volume of traffic, passenger revenue was 10·7 per cent. higher, but operating expenses were so heavy that the railway lost money on passenger services, with the solitary exception of the New York, New Haven & Hartford.

Of all countries the U.S.A. seems to have the largest reservoir of potential passenger traffic, for its population of 150 million enjoys a high standard of living and likes to have new experiences and to see strange places. Yet last year passenger trains ceased to run on 7,000 miles of railway. Passenger services were provided on only 60 per cent. of the total route mileage and no more than 7 train-miles a day were run over the average mile of road. The average train carried 97 passengers; at the height of wartime passenger traffic in 1944, the average number of passengers per train was 201 and in 1950 it was 89. These figures bring out the difference between the effect of a worldwide conflict and a war localised in Korea.

Journeys on the U.S.A. railways are classified under three heads: (1) *commutation*, corresponding to season-ticket travel on British Railways; (2) *coach*, representing third class travel; and (3) *parlour and sleeping car*, roughly equivalent to first class travel.

The latest figures available are for the year 1950. The total number of journeys was then 486 million. Commuters, travelling regularly for an average distance of 18 miles, accounted for 277 million journeys—more than half the total and nearly the same as the number of journeys made by season-ticket holders in this country for a distance of about 13 miles. Coach passengers, travelling for 94 miles on an average, numbered 186 million; third class ordinary passengers on British Railways numbered 457 million and travelled for 30 miles. Passengers in parlour and sleeping cars numbered 23 million and made long trips averaging 411 miles. British Railways booked over 25 million first class passengers in 1950, but the demand for this type of accommodation has since declined.

About 70 per cent. of American railway journeys originate in the populous Eastern District, north of the Ohio River and east of the Mississippi. Conditions there are not unlike those in which British Railways operate. Between many important centres a return journey can be made easily in one day. New York, Philadelphia, Baltimore, and Washington are as close together as London, Grantham, York, and Darlington. New York and Boston are but 232 miles apart. A brisk traffic passes between New York and Chicago by several routes exceeding 900 miles in length, but the average journey in the Eastern District is about 58 miles for a coach passenger and 311 for the passenger in a luxurious car.

The Pennsylvania has much the largest passenger business, carrying 75,192,000 million people in 1950. It operates about 100,000 passenger train-miles a day over 5,420 miles of road. In other words, 18 trains a day run over each mile of road open for passenger service; they run fast, recording an average speed of 44 miles an hour. Since 1947, train mileage has been reduced by nearly 8½ million a year, or 18 per cent. Last winter, 6,000 train miles a day were cut out because receipts failed to cover the out-of-pocket cost of $3·5 a mile. Further cuts are not unlikely, as the Pennsylvania is making a special study of its losses on passenger train working. In 1951, its passenger revenue of $156 million was a fifth part of its freight revenue, but was equivalent to 17 per cent. of the total passenger takings of the U.S.A. railways and was not much short of half the takings of British Railways. It should be possible to earn a fair profit on a business of that size.

In August, 1951, the Eastern railways increased round-trip fares for distances over 225 miles, but it is too early to judge the effect of the change. At that distance road competition may be less acute, but air services begin to be intensive. The railways with runs of 2,000 miles or more to the Pacific coast are not the only lines to suffer from the rivalry of air transport. The number of very long journeys on the Western railways is in fact comparatively small. The Santa Fe streamline trains have been widely publicised, but in 1950 the total number of its passengers was 3,616,500, less than one per cent. of the number booked by the Southern Region of British Railways. The average coach journey was 376 miles, but 736,860 journeys in parlour and sleeping cars averaged 1,087 miles. The long distance travellers paid an average fare of $31 and in all contributed more than half the total passenger revenue of $44·8 million—less than a ninth of the Santa Fe freight revenue. The Santa Fe also advertises its restaurant car services extensively. Last year the ratio of the direct expenses incurred in providing meals in these cars to receipts was 156 per cent. The ratio for all the U.S.A. railways was 138 per cent. and they lost $30·9 million on catering for passengers. This deficit represented the revenue from about 2,313 million freight ton-miles. The number looks large, but is only 0·35 of the total ton-miles.

The losses, which the Interstate Commerce Commission estimates were incurred on passenger services in 1951, were equivalent to the revenue from 7·5 per cent. of the total ton-miles. A receipt from a passenger-mile of 2·6 cents was nearly double the revenue from a ton-mile, but for every passenger-mile the U.S.A. railways worked 18·5 ton-miles. The result was that the total passenger revenue was no more than 10·4 per cent. of the freight revenue; before the first world war the percentage was about 30. The position in this country was very different. Takings per passenger-mile of 1·24d. last year were slightly more than half the revenue per ton-mile and for every 10 passenger-miles British Railways worked 11 freight ton-miles. The total passenger revenue was close on 47 per cent. of the freight revenue, compared with 62 per cent. in 1937 and 67 per cent. in 1938. A decrease year after year since 1948 in average takings per passenger-mile and per journey does not encourage hopes of an improvement in the earnings of the passenger department. On the U.S.A. railways freight train operations became predominant long ago: last year they were accorded priority on British Railways and that arrangement may remain permanent.

D

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

The Output of Railway Ton-miles

August 18

SIR,—The article in your August 15 issue closed with a reference to the Pennsylvania's output of ton-miles, but did not mention that last year's performance was a record. A graph prepared by the Pennsylvania Railroad shows that the average number of tons carried one mile in each freight train hour rose from 8,829 in 1921 to 16,000 in 1938 and then to 22,526 in 1951. Over the period of 30 years, there was thus an increase of 155 per cent. in "net ton-miles per train hour." The diagram indicating the progressive improvement in operating efficiency can be reproduced clearly on half a sheet of notepaper.

Yours faithfully,

Frognal, N.W.3 R. BELL

Continuous Brakes and Automatic Couplings

August 6

SIR,—It is gratifying to note that British Railways are steadily increasing the number of wagons fitted with continuous brakes and also the number of completely fitted trains running weekly.

Apparently we have not made any progress towards automatic couplings—they were compulsory in America over fifty years ago. By their use not only is the yard work considerably expedited but the risk of death and injury to personnel is greatly reduced. British railway shunters with their poles and the wagons with link couplings are anachronisms which should not be tolerated any longer.

It would be interesting to know if British Railways have considered the use of automatic couplings for freight trains and, if so, what action they intend to take.

Yours faithfully,

G. RICHARD PARKES

The Drover's Inn, Stalybridge

Train Cruises

August 14

SIR,—For years I have urged in your columns and elsewhere that many branch lines could increase their prosperity by exploiting their picturesque qualities and developing a new public interest thereby. I have recently discovered a perfect example of this being done in North Wales, where a "land cruise" train [described elsewhere in this issue] covers many miles of single track line through beautiful country between Rhyl and Barmouth *via* Corwen, Bala Junction and Dolgelley, returning to Rhyl *via* Afonwen and Bangor, covering some 150 miles for about 13s. 6d. This train runs every weekday in the season and is deservedly popular.

I urge that this type of traffic be encouraged and developed wherever opportunity offers. It appeals to a sober section of the public to whom a streamlined chromium-trimmed luxury motor coach is an intruder in the rural scene, with which a simple railway line with its station gardens is in perfect harmony.

The Nidd Valley line from Harrogate to Pateley Bridge is a suitable line for a scenic excursion too. The popularity of scenic excursions from Leeds to Whitby returning *via* Scarborough is a further indication that many people are prepared to enjoy the scenery from the railway, though these trips are largely over main lines.

To encourage this type of traveller a new guide book is called for. It would list the lines in every district radiating from the tour centres in the order of their scenic attraction, with notes to show whether the service is regular, regular excursion, or occasional. It would contain historical notes both about the railway and features of the landscape. Attractive station gardens would be indicated.

I am sure that, if invited, railway students and societies would be delighted to participate in producing such a guide by working in their own areas on research. Other lines outside the British Railways network, such as the Snowdon Mountain, the Eskdale, Talyllyn and Romney, Hythe & Dymchurch railways, would require mention, and I am confident the guide would increase railway-mindedness.

In addition, I frequently regret that local guide books published by resorts contain little mention of the scenic attractions of the local railway lines. In North Wales, however, I must certainly pay tribute to the high standard of railway publicity methods which makes full use of the scenic lines available.

WILLIAM B. STOCKS
(Chairman, Huddersfield Railway Circle

22, Heatherfield Road, Marsh, Huddersfield

Ribbon Development Along Railways

August 7

SIR,—In 1935 the Government passed the Restriction on Ribbon Development Act, described as an Act to prevent the indiscriminate erection of buildings along main roads which not only destroys the amenities of the countryside but also tends to obstruct the easy flow of traffic.

It seems to me a pity that the Act was never extended to railways. Ever-increasing ribbon development is taking place along our main lines and much of the building could well be done elsewhere. For instance, the main line from London to Guildford is, or soon will be, built up for about 27 of its 31 miles. Since the war there has been building development west of Esher, almost continuously between West Weybridge and Woking, and north of Guildford. There are still about two miles of green on the South side of the railway between West Byfleet and Woking in the form of West Byfleet Golf Club, but now this is to be compulsorily purchased for house building. Building is also contemplated between Woking and Worplesdon. In addition there are three large sewage works beside the line at Berrylands, Hersham, and West Weybridge. On the other hand the journey to London by road is comparatively unobstructed until the outskirts of London are reached. Little wonder the blinds of the "Devon Belle" observation car are usually drawn until Woking is passed.

Yours faithfully,

J. B. LATHAM

18, Wheatsheaf Close, Woking

British Railways Colour Schemes

August 8

SIR,—Without wishing to be thought an æsthetic prude, I cannot help thinking that, considering we are in the fifth year of integration, our Regional authorities are far too fond of polychromatic trains.

I have sometimes thought of calling the environs of Waterloo "Rainbow Corner." True, the British Railways livery tries hard to keep its end up, but the "wearing of the green" is still largely the theme song. To see the "Atlantic Coast Express" go out arrayed almost entirely in malachite with possibly a *soupçon* of "new look" round the waistline is quite revolting. Even worse is the spectacle of a Bournemouth train which has added to the *mélange* as before a "six-piece" costume of plum-and-spilt-milk (now alas ! with the ravages of time resembling prune-and-stale cheese). To complete this melancholy sartorial display, the sidings in the vicinity frequently harbour a few ancient vans still bravely flaunting what was once the rage in Swindon and Doncaster, but lacking a thin black border to round off the funereal ensemble.

I am not unmindful of the "fruit salad" epoch at Euston and St. Pancras in 1923-24, but somehow I don't think the six main ingredients of the L.M.S. colour-scheme clashed quite so horribly. Besides, I am reasonably sure the crimson monochrome speedily became *de rigueur*.

Yours faithfully,

J. E. L. SKELTON

9, Keble House, Manor Fields, Putney Heath, S.W.15

THE SCRAP HEAP

Journey to the Interior

A friend who travelled North the other day tells me of an unusual incident in his carriage. Through the half-open door leading from the corridor suddenly darted a tiny mouse. In the middle of the compartment it sat up and begged. My friend could only assume that hunger had driven it out of the restaurant car.—*Peterborough in "The Daily Telegraph."*

Railwaymen and Railway Workers

A railwayman working in an engine shed will not only know about the locomotive he is working on but about earlier types from which it is derived. A railwayman tracklaying does not stand aside to let a train pass; he stands back for the 5.25 Bristol to Water Orton slow goods—and it's just about on time. A railwayman cartage driver collecting goods from a warehouse and seeing a pile of packing cases about to go off somewhere else will ask if they too cannot be sent my rail; and will undertake to ask his goods agent about a rate; and a railwayman acting as goods agent will seek out the most advantageous rate for the customer and go out after the traffic. . . . How are railway workers to be made into railwaymen again? This is perhaps the most important human problem on the railways.—*From "The Manchester Guardian."*

Thunderbolt at Home

Filming by Ealing Studios Limited of "The Titfield Thunderbolt," the story of a fight to save a rural branch from closure (see our May 16 issue) is in progress on the Western Region line from Limpley Stoke to Camerton. Our correspondent's photograph reproduced herewith shows Monkton Combe Station re-named for the film, and at the platform the train (with buffet car for the refreshment of a financial benefactor) with which the inhabitants of Titfield keep the line open at their own expense.

Readers may recognise the buffet car as a former vehicle of the Kelvedon & Tollesbury Light Railway. Later, this train is wrecked by the proprietors of a single-decker bus competing for the local traffic, but the branch is kept open by borrowing the original "Titfield Thunderbolt" locomotive from a museum. This is the ex-Liverpool & Manchester Railway locomotive *Lion*, which has appeared in films before. The branch line, also, has been the setting of a previous film, Camerton Station having been named "Fal Vale" for making the film version of "The Ghost Train" in 1931.

Clear Line for Elephant

The journey by narrow-gauge railway through the jungle in Japanese-occupied Siam, in 1945, of two British officers dropped by parachute, is described by Stanley Moss in "A War of Shadows."

"At first" the author writes "it was thought that we would have to travel in a single truck pulled by an elephant, but owing to the diligence of a native mechanic . . . an ancient Hornsby engine, out of commission since the Japanese occupation, was somehow patched up with the aid of pieces of string and bamboo-stems, and pronounced track-worthy. No more than eight feet in length, this extraordinary piece of mechanism required a crew of five to run it, one to drive and four to push it when starting."

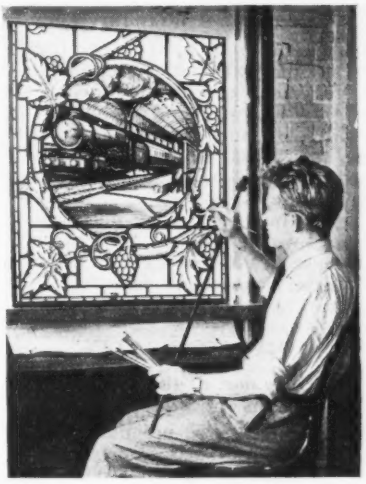
The engine careered through a herd of buffalo. When an elephant was met, hauling a wagon in the opposite direction, "the members of our crew merely lifted the engine bodily to one side of the track, allowing the elephant to pass by, then gently replaced it upon the line."

Photo,] *[P. Harden*

Monkton Combe Station re-named for making the Ealing Studios film "The Titfield Thunderbolt"

"Cornish Riviera" Window

It will not be long before the Paddington Parish Church of St. James's receives the new west window depicting scenes typical of life in the borough to which we referred in our June 27 and August 1 issues. The view of the



Working on the "Cornish Riviera" window for St. James's Church, Paddington

"Cornish Riviera Limited" express leaving Paddington, which typifies the close association of the church with the railway, is seen in the illustration we reproduce of final touches being given to the design at the works of Goddard & Gibbs.

Accidents in Pakistan

During the year 1951-52 there was only one major accident involving a passenger train on Pakistan railways, that at Ghotki on the North Western Railway on June 17, 1951.—*From the "Continental Daily Mail Special Survey of Pakistan."*

To "A. B."

(*In answer to his verse in our August 1 issue*)

I must say that I fail to see
The justice of your thrust at me.
As you used verse in praise of steam
Then to me it would surely seem
That I in turn may use it too
To express the contrary view,
But you calmly assert that I
The rigid rules of verse defy.
"The rigid rules of verse"? My hat!
Pray, Dear Sir, which B.S. is that?

W. C. J.

XUM

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Possible New Line in Natal

Dr. D. F. Malan, the Prime Minister, Mr. P. Sauer, the Minister of Transport, and the Minister of Lands have been visiting Sordwana, on the North Coast of Natal, to study the possibilities of building a new harbour in the area, and also to inspect a proposed new railway route from this area to the Transvaal.

ISRAEL

Underground Railway for Haifa

A scheme for an underground line to connect the port quarter of Haifa with the residential quarter on Mount Carmel has been evolved by the Haifa municipality and a Swiss firm. The line, some 5,600 ft. long, would use a tunnel 30-50 ft. below the surface, and expenditure is assessed at $2,500,000. There would be two intermediate stations with escalators. The capacity would be 20,000 passengers a day; the total distance would be covered in 8 min.

UNITED STATES

Dieselisation of the "Frisco"

The latest Class 1 railway to complete its dieselisation programme is the St. Louis-San Francisco, or "Frisco," as it is generally known. With 4,925 route miles of track this is the largest railway in the world to be operated by diesel locomotives exclusively. Based on St. Louis, the system extends south-eastwards to Memphis, the steelmaking centre of Birmingham (Alabama), and Pensacola, on the Gulf of Mexico; south-westwards to Springfield (Missouri), Tulsa, Oklahoma City, Dallas, and Fort Worth; and north-westwards to Kansas City. Despite its title it has no connection with San Francisco.

Group Economy Fares

Reference was made in the June 11 issue to the "family fares" introduced experimentally by the New York Central and Chesapeake & Ohio systems. From June 25 the plan was extended by these two companies, and joined in by thirteen other railways serving the eastern states—the Baltimore & Ohio; Central of New Jersey; Delaware Lackawanna & Western; Erie; Grand Trunk; Lehigh Valley; Monon; Nickel Plate; Norfolk & Western; Pennsylvania; Pittsburgh & Lake Erie; Reading; and Wabash.

It is applicable only to "coach" or third class travel, and in addition to families it is designed to benefit small parties of not less than three adults, travelling for distances of at least 100 miles. If the equivalent of not less than three adult fares is paid (which may be two adults with two children of under 16 years), children of under 12 years accompanying any such party travel free. The tickets are issued at a reduction of 25 per cent. on the ordinary fares.

As an example, three adults travelling in "coach" accommodation from New York to Chicago and back pay $39.15 each instead of $52.25. A family consisting of father, mother, one child between 12 and 16, and two children of under 12, travelling from New York to Cincinnati and back, now need pay only $107.25, *plus* tax, for the 1,500-mile round journey, compared with the previous $171.60 *plus* tax.

SPAIN

Reconstruction of R.E.N.F.E.

The Minister of Public Works stated on July 18 that the Spanish railways had to catch up arrears of about twenty years in reconstruction and maintenance. In recent years, the railways, subsidised by the State, had been granted loans totalling 6,000,000,000 pesetas. Including loans received lately this total had now risen to 12,700,000,000 pesetas. Spain would welcome foreign assistance for the reconditioning of her railways. According to some estimates, a minimum of $200,000,000 would be needed for renewal of rolling stock alone. The Minister, however, said that the U.S.A. had granted, from the time it had decided to assist Spain until July, 1952, only $7,500,000.

PORTUGAL

Results for 1951

The operating receipts of Portuguese Railways for 1951 totalled Escudos 616,476,000 against expenditure of Esc. 606,667,000, to which must be added the financial charges. The accounts for 1951 closed with a debit balance of Esc. 60,925,940, as against Esc. 67,894,108 a year previously, increasing the accumulated debit balance to Esc. 81,928,597.

The Administration considers that better financial results may be brought about by adequate increases in rates and fares. At present passenger traffic represents only 40 per cent. of the traffic potential. Nevertheless, there was a slight improvement during the first four months of this year, when passenger receipts exceeded by Esc. 19,164,000 those for the same period of 1951.

DENMARK

"Scandinavia-Italy Express"

From May, 1953, the "Scandinavia-Italy Express," now running from Stockholm and Copenhagen to destinations in Switzerland, Italy, and Austria *via* the Great Belt train ferry, Padborg, and Hamburg, is to be routed by the new Gedser-Grossenbrode train ferry and Lübeck, rejoining its present route at Lüneburg, between Hamburg and Hanover; it will thus by-pass Hamburg. Overall journey times between Sweden and Danish stations on the one hand, and Swiss, Italian, and Austrian on the other, will be cut by 2-3 hr.

Dancing Cars

The State Railways have rebuilt two bogie coaches for use in excursion trains. These now incorporate a dance saloon about 23 ft. long with a plastic floor and a restaurant adjoining with bar and tables. The partition between these two

Interior of Danish State Railways excursion coach with restaurant in foreground and dance saloon in rear

saloons has very large windows. In both saloons there is amplifying equipment operated from a special compartment with a gramophone. Next to the dance saloon is a room for the excursion conductor, with a microphone for announcements. A small kitchen is also provided. One car is stationed at Copenhagen, the other in the Jutland Division.

The cars, with necessary staff, are for hire in special excursion trains. When not required for dancing, the large saloons are fitted with tables hinged below the windows and with movable chairs.

A notable provision of facilities for dancing in a European train was the first class Pullman with a dancing floor in the "Côte d'Azur Pullman" express running by day between Paris and the Riviera during the winter of 1929-30.

Passenger Traffic Developments

In answer to complaints that high-speed trains were still operating at speeds below the prewar level it has been pointed out that the State Railways are aiming at speeds even higher than prewar. The limiting factor is the restricted funds available for improvements to the permanent way, though slow progress is being made.

Air-conditioning of ordinary passenger trains is said to be beyond the means of the State Railways at least temporarily. The *elettroreni* (multiple-unit high-speed electric train sets) are air-conditioned, but this amenity, it is stated, cannot be provided at present for all passengers. Italy, perhaps, is the country in Europe with the largest amount of air-conditioned rolling stock.

ITALY

Reconstruction of Formia-Gaeta Line

Reconstruction has been decided on of the 5½-mile branch from Formia, on the Rome-Naples *direttissima*, to Gaeta. This line, including the viaduct over the Rome-Naples road was destroyed in 1943, since when the town of Gaeta, with a population of 20,000, has been deprived of railway facilities.

FRANCE

Causes of Deficit

The financial results of the S.N.C.F., given in the August 15 issue, are quite beyond its control. It may not fix tariffs or wages or prices which affect expenditures. The deficit compares with one of 86,700 million francs in 1950. As expenses rose from 370,000 million to 460,000 million francs, the deficit shows a relative decrease of 18 per cent. Tariffs at the end of 1951 were 14 times higher than in 1938 for passengers and 16·5 times for goods; operating expenses were at 30 and 24 times higher, respectively. The reduction in costs must result from a technical transformation policy, comprising gradual substitution of electric and diesel traction for steam traction. To continue this transformation the S.N.C.F. needs financial means. Hence the Board is disappointed that the S.N.C.F. investment credits have been drastically cut.

Railway Productivity

The number of km. units per hour of work on the S.N.C.F. in 1951 was 79·5 against 67 in 1950 and only 50 in 1938, largely because of operating economies. Km. *tonnes* per wagon in service rose 11 per cent. relative to 1950 and 95 per cent. compared with 1938. The S.N.C.F. power policy has diminished its coal consumption in 1951 by six million *tonnes* compared with 1929 with a counterpart of only 60,000 *tonnes* of high-quality petroleum products. Reduction of railway staff in 1951 brought the total down to 425,000, a decrease of 17,600 for the year and of 50,000 in three years.

WESTERN GERMANY

Return of Sleeping Cars to D.S.G.

The U.S.A. occupation authorities recently returned to the German Sleeping & Dining Car Company (D.S.G.) a number of sleeping and restaurant cars previously running in trains reserved for the occupation forces. This has enabled the D.S.G. to expand its activities in the current summer timetable. Some additional services are worked by new single-berth compartment sleeping cars.

Publications Received

Design Policy in Industry. The Council of Industrial Design, Tilbury House, Petty France, London, S.W.1. 8 in. × 6 in. Illustrated. Stiff paper covers. Price 3s. 6d.—This booklet is intended for manufacturers interested in starting or developing a design policy. It is based on papers read at the Design Congress in London in September, 1951, and summarised in the booklet. Papers on vehicle design include those of Lord Latham, Chairman of the London Transport Executive, and Dr. Michael Watter, Director of Research, the Budd Company (U.S.A.) Rail and Road Vehicles. Photographic illustrations of a London Transport poster and motor-coach show the continuance of the traditional London Transport interest in æsthetics. Other examples depicted of good design are a Budd diesel railcar, Orient Line R.M.S. *Oronsay*, and a B.O.A.C. "Comet" aircraft.

Tony's Railway Gift. By Stanley Jackson. London: Fredk. Warne & Co. Ltd., 1/4, Bedford Street, Strand, W.C.2. 9 in. × 8½ in. Fully illustrated. Price 8s. 6d. net.—This book relates the adventures of a boy whose treat on his tenth birthday is to travel on the East Coast main line. He rides on the footplate from Kings Cross to Darlington, visits Darlington Works, crosses the Forth Bridge, and returns to London in a sleeper in the "Night Scotsman." The illustrations, also the work of the author, are impressionistic rather than photographically accurate.

Die Schweisstechnik des Bauingenieurs. By Bernhard Sahling and Kurt Latzin. Brunswick, Germany: Friedrich Vieweg & Sohn. 8¼ in. × 6¼ in. 278 pp. Illustrated. No price stated.—This treatise on welding in constructional engineering deals with the subject from the point of view of the German student. Mention is made of welding in railway bridges and station roofs. The bibliography is extensive, and includes a list of German Federal Railways official studies, besides many works in English.

Handbook for Constructional Engineers. Middlesbrough: Dorman, Long & Co. Ltd. 7½ in. × 5 in. × 1½ in. 418 pp. No price stated.—The 1952 edition of the Dorman Long Handbook is considerably enlarged and gives in much detail the most recent information about the company's products. The book is composed of 15 separate sections which include dimensions and properties of rolled steel beams, channels, flat-bottom and bull-headed rails, pressed steel troughing, and safe loads of joists and cased girders. The layout allows quick and easy reference to be made. Technical data of considerable interest to structural engineers and designers are given, as well as tables of weights of steel sections, decimal equivalents, square and cube roots, logarithms, and so on. The book also has a directory in which the many products of the company are enumerated with the particular department to which enquiries should be addressed.

Lifting and Handling Equipment.—Particulars of a wide range of lifting and handling appliances are contained in an illustrated catalogue, No. 63, issued by the Angel Truck Co. Ltd. The equipment described includes hand operated and motorised light- and heavy-duty pulley blocks from 3½ cwt. up to 10 tons, overhead hand operated travelling cranes up to three-ton capacity, and different types of electric and petrol-hydraulic fork and stacking trucks.

Electric Hoists.—Steels Engineering Products Limited has issued a booklet describing Coles electric hoists and overhead cranes. These hoists can be attached to trolleys for running along a fixed monorail overhead route, or may be incorporated in overhead travelling cranes. They are designed for adaptation to any type of mounting and combine strength with lightness, due to the mild steel fabricated construction used throughout. Control is by means of a suspended push-button unit. If current fails, an automatic electro-mechanical brake comes into operation to hold the load.

Rome Underground Railway

Construction complicated by the presence of historical monuments

IN contrast to underground railways in other large cities which are built to cater for existing traffic demands, the underground railway now nearing completion in Rome was built mainly to cater for an exhibition which never materialised. This exhibition, planned for 1942, was to have taken place on a site some six miles south-west of Rome, and it is this site which will be connected with the new main line station of Rome-Termini by the new underground railway. Work on the line was stopped at the outbreak of war, but was resumed in 1946, largely as a means of providing employment, the reason why the civil engineering works were accorded priority.

Overhead Current Collection

The rolling stock will consist of motor coaches only. The current will be supplied at a pressure of 1,500 volts d.c. by means of overhead copper conductors with catenary suspension, fed from four substations. The cars are designed for a maximum speed of 100 km.p.h. (62 m.p.h.) and complete the journey of six miles, with seven intermediate stations, within 14 minutes. A train composed of eight cars will have a loading capacity of about 1,600 passengers so that the full one-way capacity, with 40 trains an hour, will theoretically be 64,000 passengers an hour. A normal interval of three minutes is contemplated.

As the line is extended for operating reasons beyond the termini, the total route length is seven miles, consisting of a double-track cut-and-cover tunnel of 2½ miles through the central area, a surface section of 3½ miles with two tunnels of ½-mile aggregate length, a further cut-and-cover tunnel of 1½ miles below the exhibition ground, and finally a short surface section heading to the depot. The curved sections have an aggregate length of 2½ miles and the minimum radius is 200 metres (656 ft.).

The line has been designed by a special department of the Italian Ministry of Transport, and built by the Società Italiana per le Strade Ferrate del Mediterraneo. The operation of the line will probably be entrusted to the Società delle Tranvie e Ferrovie Elettriche di Roma which operates the Rome-Ostia electric railway and other lines.

The construction of the line through an area full of historic monuments has not been easy. Beginning a short distance beyond Rome-Termini Station, the new railway has a station of the same name, with spacious side platforms and circulating areas for entrances, exits and interchange subways from and to the main line station. The tunnel here consists of flattened vaults of reinforced concrete, carried by reinforced concrete columns. During the excavation at this station, so many important relics were discovered that a special museum has been annexed to the underground station for their display. Because of the discoveries, excavation work had to proceed cautiously; at some places, it was even necessary to alter the plans.

From Termini Station, the line follows the Via Cavour, descending on fairly steep gradients which even extend through the next station, San Pietro in Vincoli, where the platform is on a gradient of 1 in 83. To reduce the pressure on the foundations of adjacent buildings, the station tunnel has been given the cross-section of a double-symmetrical octagonal vault of reinforced concrete. The line continues to descend, on a gradient of 1 in 33, to the next station, Colosseo, with its platforms on a 1 in 100 gradient. As the station tunnel lies in a stratum of waterbearing sand, the tunnel has here been given an elliptical double-vault cross-section similar to that of the Paris Métro. The line describes an S-curve to avoid the foundations of the ancient Colosseum on the left and the Arch of Constantine on the right. Because of the restricted height available, the tunnel of the next station, Circo Massimo, has a girder-type roof of reinforced concrete.

Surface Section

The line then follows the Via Aventino and emerges from the tunnel at Piramide de Caio Cestio Station, which adjoins the Porta San Paolo terminus of the Rome-Ostia line already referred to. The station lies in a cutting; the three-storey station building will also accommodate the administrative offices of the line. From here to Basilica di San Paolo and Magliana, the line runs mainly in the open and parallel to the Rome-Ostia line. Just beyond Magliana Station, the line turns east into the exhibition ground and reaches the exhibition terminus in tunnel. The platforms on this station are staggered and are partly in tunnel, partly in the open. Beyond the station, the two tracks rise on a short 1 in 83 ramp to the depot site.

As all the tunnel sections are close below the surface, it was necessary to resort to large-scale diversions of sewers and mains. Special difficulties were encountered in the vicinity of San Pietro in Vincoli where the tunnel penetrates an extensive network of underground caves.

MACHINE TOOL TRADES ASSOCIATION.—Between September 1 and October 11, covering the period of the International Machine Tool Exhibition (September 17-October 4), the offices of the Machine Tool Trades Association will move to the Exhibition Offices, Olympia, London, W.14, and its premises in Victoria House will be closed. During this time all correspondence should be sent to Olympia. At Olympia the Association's telephone number will be Shepherds Bush 4346, and the telegraphic address will be "Toolexhib Hammer London."

GLASGOW PARCELS DELIVERY SERVICES MECHANISED.—British Railways passenger train parcels and miscellaneous cartage services in Glasgow are now fully mechanised. Substantial progress has also been made in the mechanisation of the freight cartage services, and all the collection and delivery of traffic at goods stations in Scotland is performed by motors, with the exception of certain services in Glasgow, Edinburgh, Dundee, and Aberdeen. British Railways operate some 1,300 motor vehicles and 500 horses on collection and delivery services in the Scottish Region.

RESTRICTIONS ON USE OF ZINC REMOVED.—Because of the improvement in supplies of zinc, restrictions on the use of this metal are removed. The Copper & Zinc (Prohibited Uses) Orders, which prohibit the use of zinc, copper and alloys such as brass in a large number of manufactured articles, will be amended so that the control will apply in future only to copper and copper-based alloys. Licences will still be necessary to acquire virgin zinc, but the allocation system will be discontinued.

SCOTTISH MACHINE TOOL CORPORATION: SERIOUS SUPPLY PROBLEMS.—The Chairman of the Scottish Machine Tool Corporation Ltd., Mr. Douglas Sharp, in his statement circulated with the report and accounts for the year ended March 31, 1952, stated that the company's position as to steel supply, particularly in the higher grades, was now very serious and early improvement was essential to maintain production. The volume of orders remained high, but continual wage claims had increased the cost of manufacture, and consequently prices, to a level that must be fast approaching the ceiling for world selling markets. Further advances in this direction must be viewed with concern. At the recent annual general meeting the report and accounts were adopted and a final dividend of 5 per cent., less tax, and bonus of 2 per cent. less tax, making a total distribution for the year of 10 per cent., less tax were approved.

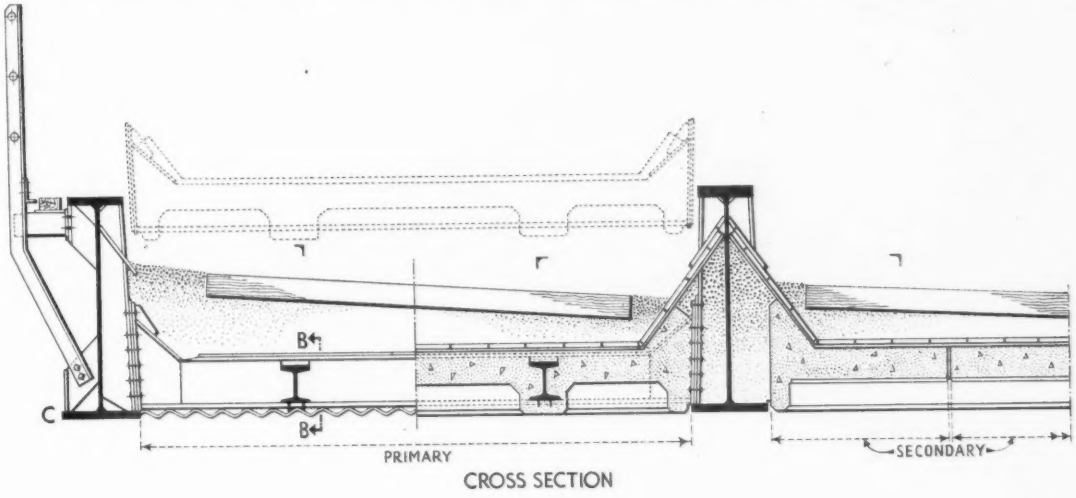
LONDON METAL EXCHANGE.—The decision to re-open the London Metal Exchange for dealings in lead was announced in Parliament on July 28. It was then stated that it was hoped to open the Exchange on October 1. The Ministry of Materials announces that agreement has been reached with the Committee of the London Metal Exchange on October 1 for the re-opening. The Ministry will make no new contracts after September 30 for the sale of lead.

British Railways Through-Type Underline Bridge

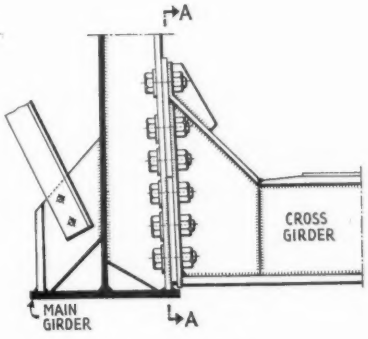
Recent developments on the Western Region to facilitate erection and maintenance

THE trend of modern design is towards the bridge which is simple to assemble, will involve the least possible interference with traffic during erection, and will require the absolute minimum of attention in its future maintenance. It is with these objects in view that the welded plate girder bridge having a prefabricated deck of concrete and steel units has been evolved on the Western Region of British Railways. The new 50-ft. double-track through-type span carrying the West of England main line over the Holybrook stream some four miles west of Reading is the first of the type, though three similar bridges carrying single tracks have been constructed on the East Usk branch near Newport, Monmouthshire.

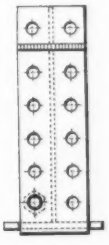
The main girders are of all-welded mild steel construction. The decking, of primary and secondary units, is secured to the main girders with high-tensile steel bolts. There is no site-



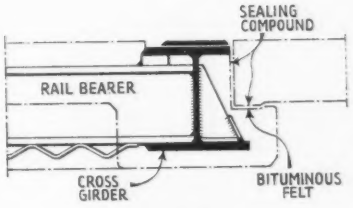
CROSS SECTION



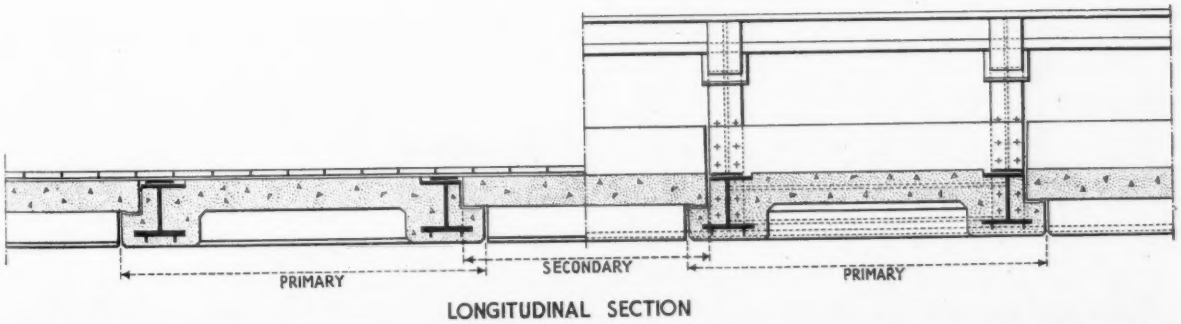
DETAIL AT C



VIEW A.A.

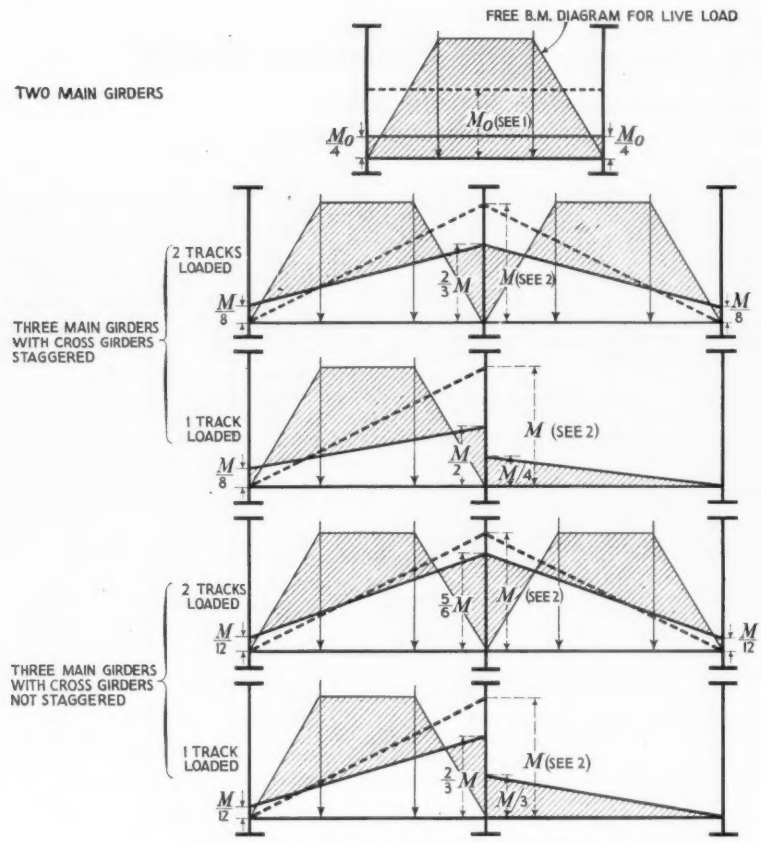


SECTION B.B.



LONGITUDINAL SECTION

Diagram showing assembly of primary and secondary deck units in new-type all-welded through-type plate girder bridge



1. FOR BRIDGES WITH TWO MAIN GIRDERS, AND WHEN CROSS GIRDER IS SYMMETRICALLY LOADED, M_O = AVERAGE HEIGHT OF FREE B.M. DIAGRAM
2. FOR BRIDGES WITH THREE MAIN GIRDERS, M = END MOMENT FOR FULL FIXITY AT CENTRE GIRDER. (WHEN LOADING IS SYMMETRICALLY PLACED ON EITHER OR BOTH CROSS GIRDERS, M = 1·5 TIMES THE AVERAGE HEIGHT OF THE FREE B.M. DIAGRAM)

End fixing moments on cross girders

riveting or site-welding during erection and, although there is some concrete to be cast after assembly, this is nothing more than a filling between the deck and the main girders, and it can be readily placed in position between trains after the bridge has been opened to traffic.

Primary and Secondary Deck Units

The primary deck units are of mild steel and consist of two cross-girders and a pair of stringers welded together, and the whole is encased in reinforced concrete precast with the deck to form a complete unit. The ends of the cross girders are tapered to the same slope as the face of the stiffeners on the main girders to which the cross girders are bolted.

The unit, therefore, can be lowered down between the main girders without the need for moving the latter after they have been unloaded and set in their final positions on the bedstones. Plates to take the full shear from the cross girders and welded on the face of the stiffeners serve as erection " ledges " on which similar shear plates on the ends of the cross girders rest while the unit is being bolted up. The secondary units, three in the width of the deck under each track, span the 6-ft. gaps between the primary units. The precast concrete at the sides of all units is haunched up to contain the ballast, and the deck is waterproofed overall.

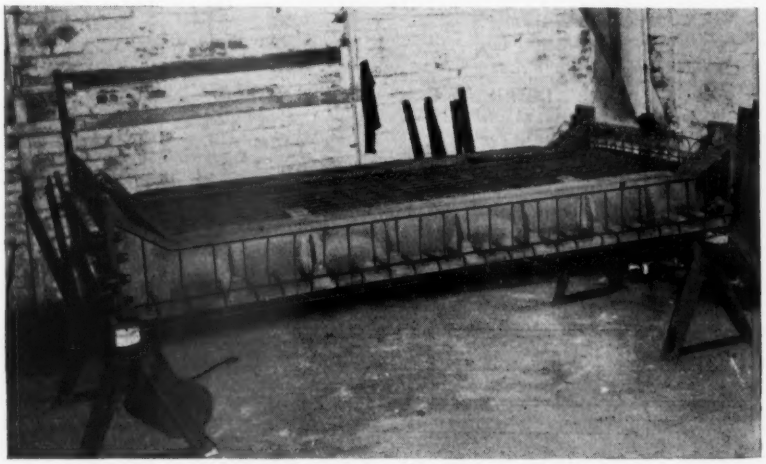
Fabrication and Bolting

In fabrication, a high degree of accuracy is necessary to ensure a good fit between the ends of the cross girders and the sloping face of the stiffeners. This has not presented any special difficulty, and it has not been found necessary to call for any machining of the contact surfaces.

The whole of the steelwork was first of all put together, and the cross girders were fully bolted up before any concrete was cast. Then the steelwork of the decking was removed and the reinforced concreting of the primary units was completed. All the precast concrete work was done by the fabricators of the steelwork, who assembled the completed units between the main girders in their works and proved them before the span was despatched direct to the site for erection.

The black bolts securing the cross girders to the stiffeners are of high-tensile steel—47 tons per sq. in. ultimate—and the nuts are of mild steel. The nuts below the top of the concrete are welded to the end-plates of the cross girders before the concrete is placed. Case-hardened steel washers are placed under the head of each bolt as well as under the nuts of the top pair of bolts, in the holes for which parallel drifts are inserted to locate the units. The diameter of all holes is $\frac{1}{8}$ in. larger than the bolts, the shanks of which are not machined.

The bolts, which are tightened to a predetermined torque, are stressed to within 85 per cent. of the yield point of the steel. The tightening is done with ordinary spanners of sufficient length to enable the torque to be easily attained without resort to hammering, and the torsion is checked afterwards with a special torque-measuring wrench, recording in lb.-feet the torsion exerted to turn the bolt in the nut. Experience has shown that high-strength bolts so



Steelwork of primary deck unit complete with reinforcement prior to concreting

New 40 ft. span erected at Holybrook Bridge near Reading West. Note the absence of conventional full-length stiffeners outside welded girders

View inside main girders at Holybrook Bridge showing upper parts of inclined stiffeners

tightened stay tight under exacting conditions where hot-driven rivets have worked loose.

Bending Moments and Tests

Special attention has been given to the design of the joints between the cross girders and the main girders, and the connecting bolts are arranged to withstand the full bending moment induced under the conditions of end-fixity. For the purposes of design this moment has been assumed to be that induced at the central main girder when the cross girders under each track are considered as being continuous, spanning right across the bridge between the outer main girders and freely supported at the three main girders. The extent of this moment has been checked by actual test on the steelwork set up in the maker's works. For the tests, the main girders, supported under the bottom flanges at points adjacent to the ends of the cross girders, were spanned above with temporary steel beams, against which the load on the cross girders was applied by hydraulic jacks fitted with gauges. The stresses in the bolts and in the flanges of the cross girders were measured by means of electrical resistance strain gauges.

The data obtained from these tests show that the absence of complete rigidity in the structure to which the cross girders are attached is beneficial, as it results in considerable reductions of stress at the ends of the cross girders and on the bolted joints, without greatly increasing the stress at the centre of the cross girders. As a basis of design, the end fixing moments on the cross girders, under live load, are in future being taken as shown on the accompanying diagram.

Completed primary deck unit being lowered into position between tapered faces of main-girder stiffeners, to which it will be bolted

Connection of cross girders to main-girder stiffeners during assembly at maker's works, before dismantling and concreting of primary deck unit. Note shear plates and high-strength bolts

Following the erection of the Holybrook bridge, the lateral displacement of the top flanges of the outer girders under the passage of trains has been carefully measured. This movement is less than $\frac{1}{32}$nd of an inch.

Protection of the Steelwork

In accordance with the latest practice on the Western Region, all surfaces of steelwork not encased in concrete have received special protective treatment. All mill scale was removed, the surfaces were painted with two priming coats (one of red lead and one of red and white lead) before despatch from the works, and two final coats of micaceous iron ore paint were applied immediately after erection.

Designed and built to the requirements of the Civil Engineer, Western Region, the Holybrook and East Usk Branch bridges have been fabricated by the Fairfield Shipbuilding & Engineering Co. Ltd., Chepstow. The recording of the stresses in the tests at the works was carried out with the assistance of the staff of the Superintendent of the Railway Executive Research Department at Derby.

PIG IRON AND STEEL PRODUCTION IN JULY.—The production of pig iron in July was at an annual rate of 10,482,000 tons compared with 9,484,000 tons in July, 1951. The output of steel, which was affected by holidays, was at an annual rate of 14,236,000 tons compared with 13,317,000 tons.

RAILWAY STUDENTS' ASSOCIATION.—The Railway Students' Association, London School of Economics & Political Science, has made arrangements with the Port of London Authority for accommodation to be reserved on a motor launch on Saturday, September 13, for a Thames cruise. The launch will leave Tower Pier at 2.30 p.m. and cruise down the river for an inspection of the King George V and Royal Albert Docks, arriving back at 6.15 p.m.

Sleeping Cars for Nigerian Railway

Construction of first, and first and second class all-steel stock of vestibule design

AMONG the orders recently completed by Cravens Railway Carriage & Wagon Co. Ltd. are four first and three first and second class sleeping cars for the Nigerian Railway. The stock is built to the requirements of Mr. T. B. Welch, Chief Mechanical Engineer, and under the supervision and inspection of the Crown Agents for the Colonies. The leading dimensions of both types of stock are as follow:—

Gauge	3 ft. 6 in.
Length over headstocks	60 ft.
Centres of bogies	46 ft.
Bogie wheelbase	7 ft.
Tare weight :—	
First class cars	29 tons 16 cwt. 1 qr.
First and second class cars ...	29 tons 11 cwt. 3 qr.

Constructional Details

The cars are of all-steel construction, the underframes and bodies being built as a unit; the sub-assemblies consisting of underframes, body sides, ends and roof units are jig built. The underframes are of all-welded construction, and the other sub-assemblies are of riveted construction, with welded joints where this is advantageous, the sub-assemblies being joined by riveting. The body side and end panels are of mild steel 12 s.w.g. thick, secured to the body framing by rivets. All panels joints are butt-welded and ground to provide a flush exterior.

With a view to providing against corrosion, the roof sides at cantrail level overlap the bodysides and the bottom edges of the side panels are turned under to a depth of $\frac{5}{8}$ in., a design which provides a run-off for water. Enclosed vestibules with telescopic gangways provided with hinged plates and handrails allow passage to other cars when coupled together. Sliding intercommunication doors and hinged side doors are fitted at the vestibule entrance. Fixed steps and handrails are provided at each end for access to cars from rail level.

Roof Structure

The roof structure is of all-welded construction, a separate jig built unit, principally of mild steel pressings. The carlines are composed of four 14 gauge pressings. The purlins are continuous and extend the full length of the car. Carlines are welded to the purlins and are secured to the cantrail angles by $\frac{3}{4}$-in. dia. rivets. The roof panels are of 16 gauge mild steel. The interior ceiling panels are of $\frac{1}{4}$ in. plywood spaced $1\frac{1}{8}$ in. apart, between which are bonded Onazote insulation sheets, the sheet joints being covered by aluminium mouldings.

The total depth from the roof panel to the inner plywood skin is $4\frac{1}{4}$ in. Ventilation is provided by Monarch roof ventilators, half the quantity of ventilators are arranged to ventilate the air space between the roof panels and the interior ceiling panels. In the toilets of the composite sleeping cars, exhaust fans of 9 in. diameter have been provided.

Accommodation in the first class sleepers is provided for 16 day and night passengers, fixed lower, and flush folding upper berths being fitted. Each compartment, the entrance to which is by a sliding door from the corridor, is provided with an individual toilet; the compartment furnishings include a full-length wardrobe, locker with sliding doors arranged over the corridor, a portable tubular steel armchair and a folding table. The toilet compartment lining panels are veneered with plastic from floor to ceiling. The ceiling is of $\frac{1}{4}$ in. blockboard, and arranged to provide a shelf, accessible from the passenger compartment for luggage.

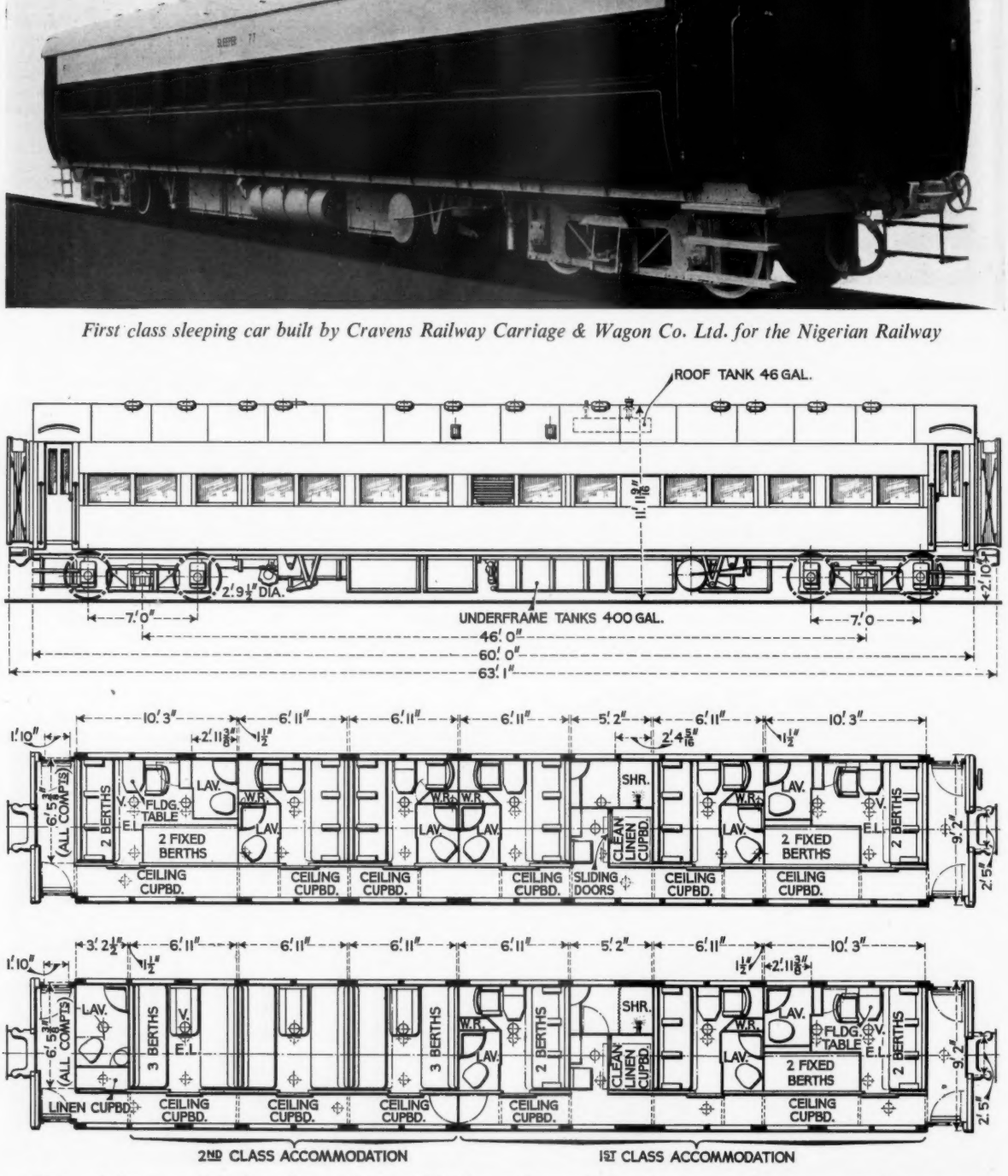
A common shower compartment is provided near the centre of the car, lined with polished 20 gauge stainless-steel panels. A "shower engaged" illuminated notice, visible from either corridor and arranged to work in conjunction with the shower door latch, is provided for passengers' convenience. Adjacent to the shower room, a large, clean linen cupboard, enamelled cream, is fitted from floor to ceiling, and below floor level is a locker for storing used linen. A control panel cabinet is provided in which the switch panel, water-raising compressor and emergency foot

First class two-berth compartment looking from the corridor side

Entrance to the shower compartment showing the arrangement of lockers

XUM

First class sleeping car built by Cravens Railway Carriage & Wagon Co. Ltd. for the Nigerian Railway



Plan and elevation of the first class, and plan of the first and second class sleeping car showing principal dimensions and interior arrangements

pump are housed, an attendant's tip-up seat and a Merryweather fire extinguisher of the Konus Kemick type are provided.

The interior finish is of eucalyptus with walnut bandings, the eucalyptus being in the form of a veneer, bonded on the ⅛ in. plywood panels and 1½ in. blockboard partitions. All seats and berths are covered with green Vynide and have Dunlopillo fillings. The seats have folding armrests and the upper berths are arranged to hinge and clip to the cross partitions when they are not in use.

Metallic fittings, including the frame of the tubular chairs, are all chrome plate finished. In the toilets, the flushing system, water pipes and so on have been concealed by introducing a cabinet which includes a frameless mirror and also two shelves.

The compartment sliding doors have unbalanced half-drop windows with obscured glass. Spring blinds are fitted to these doors. Frameless lights and Alpax louvres, both balanced and arranged to lift, are provided at the bodyside window openings. Insulation at the car sides is in the form of ½ in. thick Insulwood, secured to framing timbers before the interior panels are screwed in position. To facilitate cleaning, the linoleum, green in all cars, is coved at the body sides to a depth of 6 in. The interior furnishing is flush and designed with a view to easy removal of panels to provide for inspection of the inner surface of the exterior steel panelling.

The water supply is carried in four cylindrical underframe tanks of 400 gal. capacity and a 46 gal. roof tank over the shower. The water is pressure raised by Stone's air-compressor water-raising system, from the underframe tanks to the roof tank, from which it is supplied through copper pipes to the toilets and shower room. Isolating cocks are fitted in all feed pipes, and all casings are easily removable for access to pipes for maintenance purposes.

First and Second Class Sleepers

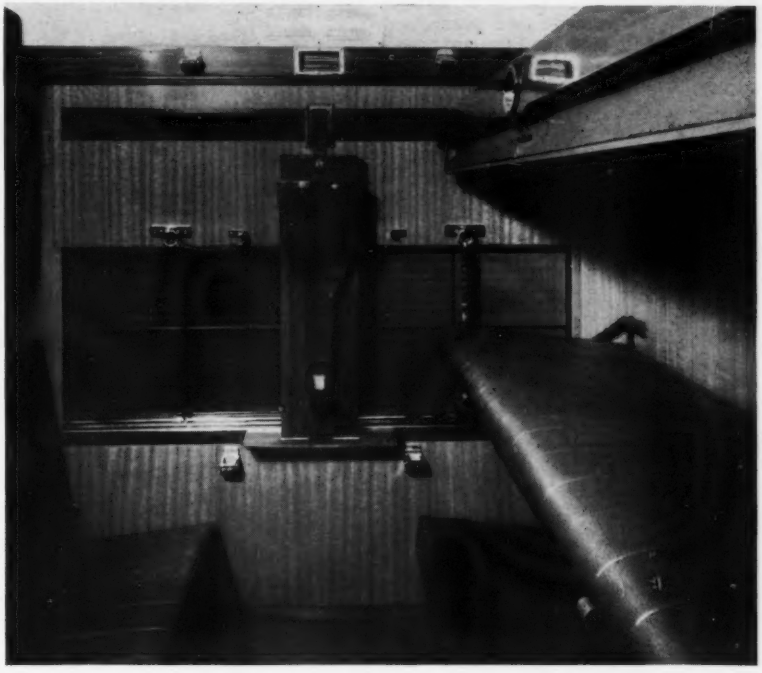
The first class end of the first and second class sleeping car is similar in design to that of the first class stock. Accommodation is provided for eight passengers. The second class end is isolated by a self-closing corridor hinged door which may be locked. Accommodation is provided in the second class end for 18 passengers in three, six-berth compartments. A common toilet, lined from floor to ceiling with stainless-steel sheets, is situated near the vestibule entrance; a linen cupboard is also provided.

The veneer in the second class compartments is Queensland maple and the banding is walnut of a slightly darker shade than those in the first class compartment. The berths have Dunlopillo fillings and are covered with brown Vynide. The middle berth folds down to provide a seat back for daytime travel. Use is made of the flat ceiling over the corridor for storing luggage and in addition a small parcel rack is fitted over the door. In these compartments a table is arranged to fold up against the body side between the windows, a mirror is fitted on the bodyside above the windows and ash trays and clothes hooks are provided.

Bogie and Break Gear Details

All cars are equipped with Sheffield Twinberrow bogies with disc wheels and roller-bearing axleboxes, and fitted with A.B.C. Non-Shock automatic centre couplers. Automatic brake equipment is provided with slack adjusters fitted to the brake gear; a hand brake is also provided, operated from one end of the car only.

All vehicles are equipped with Stone's electric lighting and have through electric couplings. The exterior of the cars is in synthetic enamel to the railway's standard colours: privet green below the top light rail, the panel over the windows being finished cream. The cars are shipped whole, painted, lettered, and ready for service.



Interior of the second class compartment showing the six berth arrangement

The following firms, as sub-contractors, supplied materials and fittings for the new cars:—

Twinberrow bogies ...	G. H. Sheffield & Co. (Engineers) Ltd.
Automatic brake equipment	Vacuum Brake Co. Ltd.
Wheels and axles	Owen & Dyson Limited
Non-Shock couplers ...	A.B.C. Coupler & Eng. Co. Ltd.
Steel sheets	John Summers & Sons Ltd.
Metallic fittings	John Levick Limited
Blockboard and plywood ...	Edmonton Panel Co. Ltd.
	Saro Laminated Wood Products Limited
Tubular seats	Cox & Co. Ltd.
Vynide leather cloth ...	Imperial Chemical Industries Limited
Electric lighting and water raising	J. Stone & Co. (Deptford) Ltd.
Frameless windows and balancing gear	Rawlings Manufacturing Co. Ltd.
Alpax louvres	Lightalloys Limited
Roller-bearing axleboxes ...	British Timken Limited
Ventilators	Monarch Controller Co. Ltd.
Interior Onazote ceiling panels	Expanded Rubber Co. Ltd.

KINGS CROSS CENTENARY.—Two centenaries are to be celebrated by the Eastern Region at an exhibition to be held at Kings Cross Station from October 13 to 18, inclusive. They are the inauguration of the station on October 14, 1852, and the completion in August of the same year of the line between Peterborough (Werrington Junction) and Retford, completing the present East Coast main line to Doncaster. The exhibition will consist of small exhibits and models section and a rolling stock exhibits section. It will cover the period from 1852 to 1952 and include examples of latest British Railways technical development and practice. Many exhibits which would be suitable for this exhibition are known to be in private possession, and railway societies and others interested are being approached with a view to lending models and records for the occasion.

RENAMING OF STATIONS IN SCOTLAND.—The following Scottish Region stations have been renamed; the new name is shown each time in parenthesis: Aberdeen Joint, (Aberdeen); Balloch, (Balloch Central); Barnhill L.M.S., (Barnhill Angus); Bogside L.M.S., (Bogside Race Course); Dalmuir L.N.E., (Dalmuir Park); Parkhead L.N.E., (Parkhead North); Perth General, (Perth); Saltcoats, (Saltcoats Central); and Scotstoun L.M.S., (Scotstoun East).

XUM

New Locomotives for Indonesia

Large delivery from Germany provides backbone of modern motive power

IN October, 1950, the Indonesian State Railways placed an order for 100 mixed-traffic 3 ft. 6 in. gauge 2-8-2 steam locomotives with the Fried. Krupp Lokomotivfabrik, Essen, and delivery of these began one year later. Half of these locomotives are coal-burning and the other half oil-burning; copper fireboxes are fitted to the coal burners and steel boxes to the oil-fired 50, but in each case the firebox is welded except for the riveted tubeplate, and in each case a combustion chamber and three arch tubes are incorporated. A maximum axle load of 12¾ tons was specified. Grades as steep as 1 in 26 are encountered on certain sections over which these locomotives are expected to work, but 1 in 40 is the steepest main-line incline.

Welding has been used more than riveting in the boiler construction. The throat plate and smokebox tubeplate connections are riveted; otherwise the joints and stays are welded. The copper boxes have drifted threaded stays, with manganese steel stays in the breaking zone; but in the steel boxes the now normal German threadless welded side and roof stays are used in both ordinary and breaking zones.

Design Features

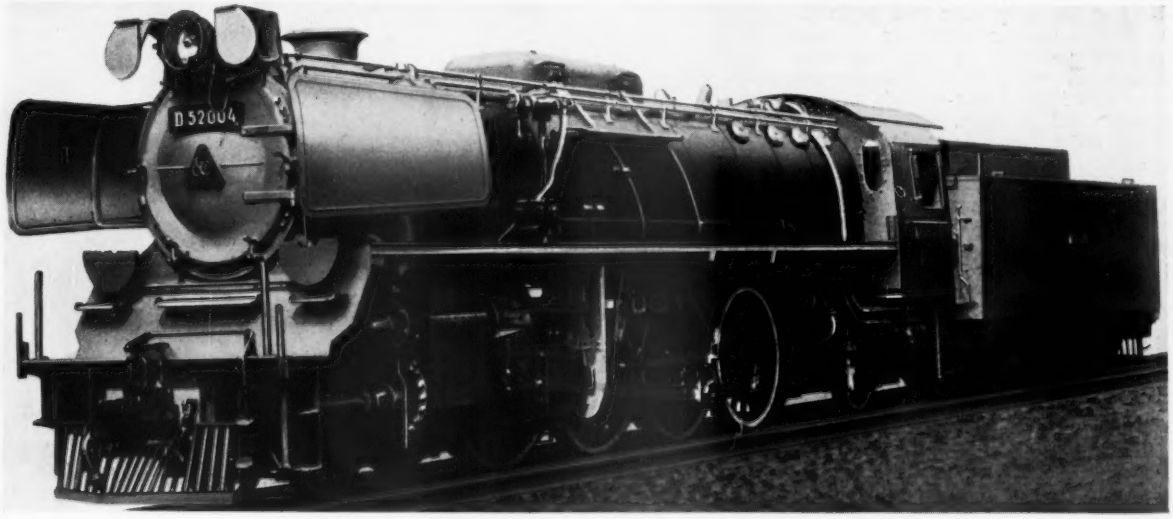
Bar frames 3·15 in. thick form the foundation, with 1¼ in. plate frames backwards from the fourth coupled axle section, and with bar frame stays of cast and drop-forged steel sections. The cast-steel coupled axleboxes have bronze liners to the guides, and bronze bearings with whitemetal linings. SKF roller-bearing axleboxes are fitted to the carrying axles. About 28 per cent. of the reciprocating weights are balanced in the wheel rims.

The cylinders have 10 in. dia. piston valves actuated by Walschaerts motion and screw reverse. A mechanical lubricator is driven off the right-hand expansion link, and has 14 feeds to pistons, valves, rod guides, and so on. Steam brakes are fitted to the coupled wheels, vacuum brake to the tender wheels, and vacuum brake equipment is installed for the train brakes.

Principal dimensions and particulars of the locomotives are:—

Cylinders (2), dia. and stroke ...	19·75 in. × 23·6 in.
Coupled wheels, dia.	59 in.
Working pressure	227 lb. per sq. in.
Tractive effort at 75 per cent. boiler pressure	26,500 lb.
Factor of adhesion	4·25
Heating surface (fireside) :—	
Firebox	164 sq. ft.
Tubes and flues	1,660 sq. ft.
Total evaporative	1,824 sq. ft.
Superheating surface (31 elements)	643 sq. ft.
Grate area	37·5 sq. ft.
Adhesion weight (min.)	50·6 tons
Locomotive weight	72·5 tons
Engine and tender weight	122 tons
Maximum axle load	12¾ or 13¼ tons
Top speed	56 m.p.h.
Minimum curve, radius	460 ft.

The weight of an oil-fired steel firebox locomotive is almost one ton less than that of a coal-fired locomotive. For lightness, the tender tanks, fuel bunker, underframe, and bogie frames have been welded.



Krupp-built 2-8-2 locomotive, Indonesian State Railways

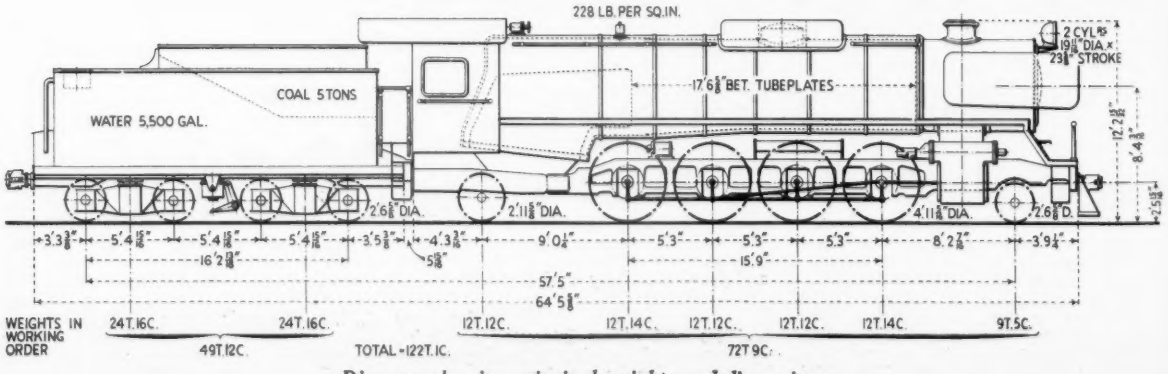


Diagram showing principal weights and dimensions

RAILWAY NEWS SECTION

PERSONAL

Mr. Claude H. Maugham has been appointed Auditor of Passenger Receipts for the Canadian Pacific Railway, in succession to Mr. Charles F. Gardner, who has retired.

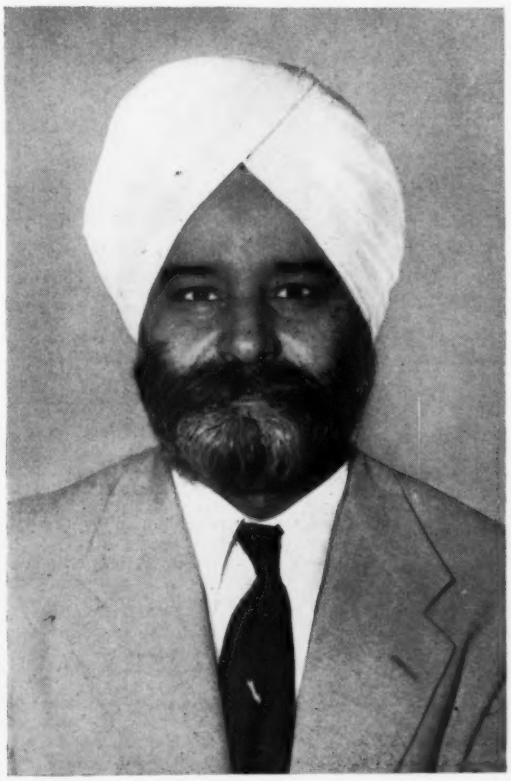
Mr. Karnail Singh, formerly Engineer in Chief, Assam Rail Link Project, who, as recorded in our May 23 issue, has been appointed General Manager, Northern Railway, India, was born in 1904. After graduating from the Thomason Engineering College, Roorkee, he joined the Indian Railway Service of Engineers in 1927 and was posted to the North Western Railway. From then until Partition he served with the N.W.R., being engaged mostly on surveys and construction and special works. Towards the end of the 1939-45 war, Sardar Karnail Singh was placed on special duty as Deputy General Manager, Rehabilitation & Development, being later in charge of surveys in the North Western Frontier Province and the Punjab. On Partition, he became Transfer Officer at Lahore, to assist evacuation of railway and other Government employees from Western Pakistan. In November, 1947, he was appointed Engineer-in-Chief of the Assam Rail Link Project.

Mr. Reginald Catlow and Mr. H. F. Hodgson have been appointed Directors of Guest, Keen & Nettlefolds Limited.

Mr. Alfred J. Ball, Foreign Freight Traffic Manager of the Pennsylvania Railroad, U.S.A., has retired.

We regret to record the death on August 8 of Mr. C. C. Claxton, Secretary & Joint Managing Director of the Sheffield Twist Drill & Steel Co. Ltd. He was born in 1899, became a Director of the company in 1936, and Joint Managing Director in 1943.

Mr. P. C. Chakravarti, B.E., M.I.E., Chief Engineer, Bengal Nagpur Railway, who, as recorded in our issue of May 23, has been appointed Chief Engineer, Eastern Railway, India, was born in 1900. After graduating in civil engineering from Sibpur Civil Engineering College, Howrah, he received practical training with the Bengal Nagpur Railway and in 1925 was appointed Assistant Engineer on that Railway. He worked as an Assistant Engineer in various Districts and at headquarters until 1936, when he visited the United Kingdom and the European Continent on holiday and studied permanent way practice in those countries. In 1944 he was promoted District Engineer and attained the rank of Deputy Chief Engineer in 1947. In 1948 Mr. Chakravarti proceeded to the United Kingdom on leave and studied the British Transport Commission and the Railway Executive, as well as civil engineering in the Scottish and North Eastern Regions. He was appointed Chief Engineer, Bengal Nagpur Railway, in 1949.



Mr. Karnail Singh
Appointed General Manager, Northern Railway, India

Mr. P. C. Chakravarti
Appointed Chief Engineer, Eastern Railway, India

Argentine National Railways

The following appointments on the Argentine National Railways have recently been announced:—

General Belgrano Railway
Mr. M. G. Alcalá, to be Acting Chief Accountant.

General Mitre Railway
Mr. J. A. Cavalli, to be Acting Chief Accountant.

D.F. Sarmiento Railway
Mr. José Bajraj, to be Acting Chief of the Stores Department.

General Urquiza Railway
Mr. Emilio Zina, to be Acting Chief Accountant.

Mr. Adolfo Kirkerup, to be Chief of the Way & Works Department.

Mr. R. T. Cortejarena, to be Chief of the Supply Department.

Mr. A. A. Verna, to be Chief of the Mechanical Department.

A portrait and biography of Mr. Kirkerup appeared in our May 25, 1951, issue.

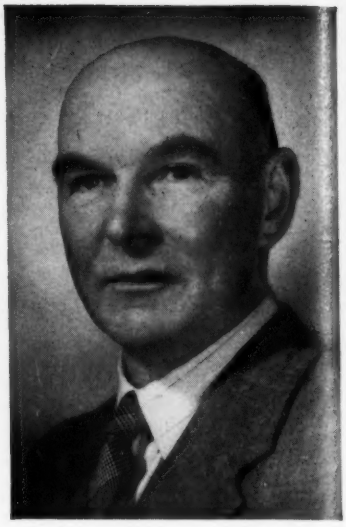
Mr. G. L. F. Welham, Production Development Engineer to the Fairey Aviation Company, has been appointed Deputy Managing Director to the Holbrook Machine Tool Co. Ltd. Mr. Welham's great-grandfather founded the original Holbrook factory about 70 years ago, and his father Mr. F. Welham, who was Works Manager before retiring, served the same company for 56 years.

Mr. F. L. Lambert

Appointed District Engineer, Newport, Western Region

The late Mr. A. E. Moore

Audit Accountant, Southern Railway, 1932-45



The late Mr. H. Maddock

Publicity & Advertising Manager, New Zealand Government Railways, 1951-52

Mr. F. L. Lambert, B.Sc., A.M.I.C.E., District Engineer, Shrewsbury, Western Region, who, as recorded in our July 25 issue, has been appointed District Engineer, Newport, joined the G.W.R. in 1929, having studied civil engineering at University College, London, where he graduated with first class honours; and was awarded the Vernon Harcourt Prize for Civil & Municipal Engineering. He served under the Divisional Docks Engineers at Newport and Cardiff and the Divisional Engineers, Wolverhampton, Taunton and Gloucester. In 1946 Mr. Lambert was appointed Assistant Divisional Engineer, Cardiff and two years later transferred to Neath and subsequently to Cardiff in similar capacities. He was appointed Acting District Engineer, Abergavenny, in 1949 and District Engineer, Shrewsbury, in 1951.

The North Eastern Region announce the appointment of Mr. S. J. Judson, Staff Assistant to the Motive Power Superintendent and Divisional Operating Superintendent, York, to Assistant (Wages Staff) to the Regional Officer.

Mr. B. Plews has been appointed Company Secretary, Trico-Folberth Limited. He will continue his present duties as Personal Assistant to Mr. P. N. Matton, Managing Director of the company.

Mr. C. B. Nixon, Chairman & Governing Director of Leyland Motors Limited, has been appointed a member of the North West Electricity Consultative Council by the Minister of Fuel & Power.

Mr. D. B. Collett, Vice-President & General Manager of the Dunlop Tire & Rubber Goods Co. Ltd., Toronto, is returning to England to join the main board of the Dunlop Rubber Co. Ltd. as an Executive Director; he will take up his new appointment in London in November. Mr. J. P. Anderson, Chief Purchasing Agent, succeeds Mr. D. B. Collett as Vice-President & General Manager, and is leaving England in the autumn to take up the appointment. Mr. L. J. W. Bailey, General Manager of Dunlop Plantations Limited, has been appointed Chief Purchasing Agent.

We regret to record the death at the age of 71 of Mr. A. E. Moore, Audit Accountant, Southern Railway, 1932-45. He entered the service of the London & North Western Railway in 1895 as a junior clerk in the Audit Office at Euston, and served under three successive Audit Accountants, Mr. John Partington, Mr. David Williams and Mr. Arthur Jones. In 1911 Mr. Moore transferred to the service of the London & South Western Railway for special work in the Audit Office at Waterloo under the Accountant, Mr. F. Hartnell, and in 1913 was appointed Audit Assistant to the succeeding Accountant, Mr. A. E. Newhook. During the period of the Government control of the railways in the war of 1914-18 Mr. Moore was an Investigator of railway companies' accounts and their claims against the Government. On the formation of the Southern Railway he was appointed one of the Assistant Audit Accountants under Mr. A. H. Bull, then Audit Accountant, whom he succeeded in 1932. Mr. Moore was Chairman of the Accountants Standing Committee from April, 1938, to March, 1939. He retired in 1945.

Viscount Falmouth has been re-elected President of the British Internal Combustion Engine Research Association.

Mr. John P. Krumech has been appointed Vice-President of Shippers' Car Line Corporation, a subsidiary of the American Car & Foundry Company.

The Minister of Transport has reappointed Sir Alan Rae Smith and Sir Harold Barton to be the auditors of the accounts of the British Transport Commission for the year ending December 31, 1952. Sir Alan Rae Smith, who is a Partner in the firm of Deloitte, Plender, Griffiths & Company, Chartered Accountants, has been from 1939 Financial Adviser successively to the Ministry of Shipping, the Ministry of War Transport, and the Ministry of Transport. Sir Harold Barton is Senior Partner in the firm of Barton, Mayhew & Company, Chartered Accountants. He was President of the Institute of Chartered Accountants in 1944-45.

We regret to record the death at the age of 56 of Mr. H. Maddock, Publicity & Advertising Manager, New Zealand Government Railways. He joined the Railways Department as a cadet and entered the former Outdoor Advertising Branch in 1917. From 1932 he was First Assistant to the Manager, and following the merging of the two branches he was made Assistant Publicity & Advertising Manager. Mr. Maddock became Publicity & Advertising Manager in 1951. During the first world war he was with the New Zealand armed forces, and during the last war was a signalling instructor with the Home Guard.

Professor Sir Alfred Egerton has resigned as a Vice-President of the British Iron & Steel Research Association governing council and Mr. H. H. Burton, Director, English Steel Corporation Limited, has been elected in his place.

Dr. F. L. Davies, who, as recorded in our August 15 issue, has been appointed Medical Officer of the London Area, London Midland Region, British Railways, undertook, as a Surgeon Lieutenant, R.N.V.R., an appendix operation in 1941 while on convoy duty in H.M.S. *Blencathra;* this was the first time such an operation had been successfully performed in a destroyer of this size in wartime. He also served with the Duke of Edinburgh, then Prince Philip of Greece, in the destroyer H.M.S. *Wallace*. Among appointments held by Dr. Davies have been Senior House Surgeon, Metropolitan Hospital, London; Resident Surgical Officer at Lister Hospital E.M.S. Hitchin; and, while at the London Hospital (1946-1950), Demonstrator in Anatomy to the London Hospital Medical College, Surgical Assistant (Registrar) to the Professorial Surgical Unit of the London Hospital in General and Genito-urinary Surgery, Senior Registrar, the London Hospital, Department of Neurosurgery, and Visiting Neurosurgical Registrar, Brentwood Mental Hospital, Essex. Dr. Davies joined British Railways, London Midland Region, as Assistant Medical Officer in 1951, since when he has also acted as Lecturer in first aid to various classes on British Railways.

Ministry of Transport Accident Report

Polesworth, November 19, 1951: British Railways, London Midland Region

Colonel D. McMullen, Inspecting Officer of Railways, Ministry of Transport, inquired into the accident which occurred at 5.30 a.m. on November 19, 1951, at Polesworth station, when the 10.30 p.m. express, Glasgow to Euston, composed of 12 bogie coaches, of which 6 were sleeping cars, drawn by a class "8P" 4-6-2 engine *City of Leicester*, was derailed as a result of passing through a crossover from fast to slow line at about 55 m.p.h. The engine and eight coaches left the rails and the engine struck the platform beside the slow line and overturned where it ended. There was no telescoping, but the soleplates of some coaches had started to ride over those of the vehicles in front and crushing of coach ends had begun. Only two of the 174 passengers were slightly injured. Both up lines were blocked. The fast line was reopened at 7.45 a.m. and the slow line at noon the following day. It was a dark clear night. The accompanying diagram shows the lines, signals and so on essential to an understanding of the case.

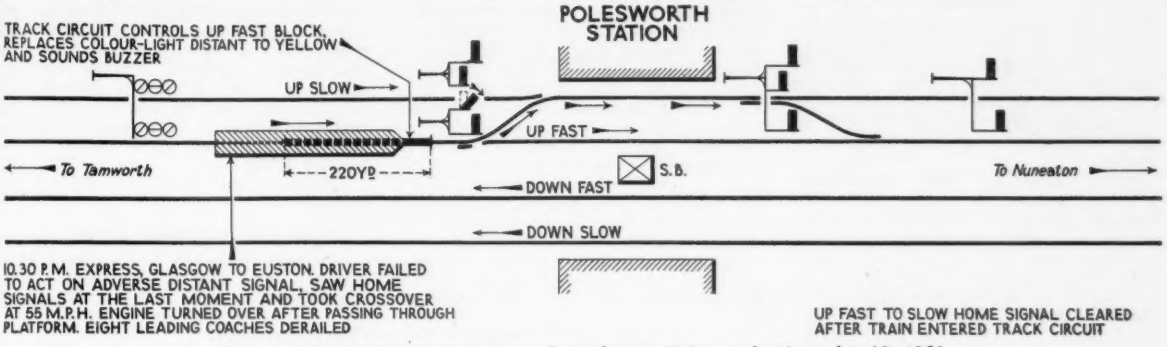

POLESWORTH STATION
TRACK CIRCUIT CONTROLS UP FAST BLOCK, REPLACES COLOUR-LIGHT DISTANT TO YELLOW AND SOUNDS BUZZER
UP SLOW
UP FAST
To Tamworth
220YD
S.B.
To Nuneaton
DOWN FAST
DOWN SLOW
10.30 P.M. EXPRESS, GLASGOW TO EUSTON. DRIVER FAILED TO ACT ON ADVERSE DISTANT SIGNAL, SAW HOME SIGNALS AT THE LAST MOMENT AND TOOK CROSSOVER AT 55 M.P.H. ENGINE TURNED OVER AFTER PASSING THROUGH PLATFORM. EIGHT LEADING COACHES DERAILED
UP FAST TO SLOW HOME SIGNAL CLEARED AFTER TRAIN ENTERED TRACK CIRCUIT

Diagram illustrating circumstances of accident at Polesworth, November 19, 1951

The aspects of the colour-light distant signals are repeated in the signal box and each such signal has an auxiliary yellow aspect, lit automatically if the bulb in the main aspect fails. When this, or a power failure, happens a "no light" indication appears and an audible warning is given. When power fails stand-by secondary batteries are switched in automatically. The speed limit through the crossover is 15 m.p.h. The following block signalling regulation is in force:—

> "In the event of it being necessary for a passenger train or other train composed of coaching stock, or a Class "C" or Class "D" freight train to be run from one line to another through a junction over which it is necessary that speed should be reduced and such route is not the regular booked route for the train to travel, the junction stop signal must not be taken off until the train is close to such signal, and the signalman must, where practicable, satisfy himself that the speed of the train has been suitably reduced."

The regulations also say that when a "no light" indication appears in the box, the signalman is to treat the distant signal concerned as having failed, unless the signalman of an adjacent box can see that the auxiliary light is burning.

At 4.10 a.m., a "no light" indication appeared at the box in advance for its own up fast colour-light distant, which was treated as having failed because the Polesworth signalman could not see it. The two men decided to divert up fast trains to the slow line at Polesworth. Three were so dealt with before the express concerned in the accident, booked to run non-stop, Carlisle to London. It was accepted by Polesworth at 5.25 a.m. and "line clear" on the slow line was obtained for it two minutes later, when "entering section" was received.

The crossover was reversed and bolted before acceptance and the signalman then noticed that the up fast distant signal was shown by its repeater as being properly at caution. He watched the train approach and cleared the home signal for the crossing movement two or three seconds after the track circuit buzzer sounded. The train was more or less head on and he did not realise it was travelling too fast until it was passing through the crossover.

The driver knew the road well. He said a slight westerly wind was causing smoke to beat down badly on his (the left-hand) side but this did not affect sighting of signals until approaching Polesworth, when black smoke from a heavy fire obscured the distant signals until he was passing under them, when he got a glimpse of the yellow light. He said he immediately closed the regulator and reduced vacuum to 15 in. and brought down the speed, but he thought they were travelling at 50-55 m.p.h. when the fireman shouted that the home signals were at danger. He then saw them 20-30 yd. in front and observed the up fast to slow signal go to green. He made a full brake application but there was no time for it to take effect before the derailment. It was not usual for the fireman to look for the Polesworth signals, as the view on the driver's side, 154 and then 200 yd., was adequate, and he did not cross to the other side to look for the home signals.

Questioned closely, the driver insisted that he was looking out and applied the brakes but could not explain why speed was so high at the home signals. The brakes had worked satisfactorily during the journey and he did not suggest that they were in any way defective. At one period of his evidence he said, "I was thinking it was Monday morning and the signalman would surely have the home signal off, as very often happens." He meant, with the distant at caution. He repeated that he was applying the brakes to stop at the home signals if necessary. His mate, a passed fireman, had been on the main line for two years. After seeing the distant for the previous box at clear, he was extracting coal from the tender when he heard the brakes being applied fully. Turning off the injector, he saw the home signals. By that time the one for the crossover movement was off. He could not recollect the brakes being applied before that and did not think the driver mentioned that the distant was at caution. Usually he looked for the Polesworth distant and when he knew it was on he would look, as a rule, for the homes. He did not see the latter until the full brake application had been made. There had been little conversation with him and he thought the driver was in his usual state of health.

The guard said that there was a sudden fierce brake application, lifting the van valve, and it was not preceded by an application such as is usual when a distant is at caution.

The driver of the 10.20 p.m. train from Glasgow, which passed Polesworth about 20 min. before, confirmed that weather conditions caused smoke to beat down on the left-hand side but it did not interfere with his view of the up distants, which he described as very good signals. The home signals were showing good lights. Other evidence confirmed that the signal lights, etc., were in good order.

Inspecting Officer's Conclusion

It is remarkable that the engine passed through the crossover at such a high speed without derailing there. The high lateral forces merely spread the gauge slightly in the trailing lead and broke some chairs. Severe oscillation distorted the track for 25 yd. beyond the trailing switches, finally causing the engine to become derailed.

Colonel McMullen feels certain that the driver missed the distant signal altogether, despite his insistence that he did see it. The brakes were in order and tests established that a reduction of vacuum by 6 in. near the distant would have reduced speed from 60 to about 35 m.p.h. at the homes. It is understandable that he did not see the latter until close to, for he did not move across and so had only 200 yd. sight of them, while smoke and steam may have obscured them for a few seconds. It is difficult to appreciate why he missed the distant. Colonel McMullen travelled at night on a similar engine, accompanied by an inspector who, with the driver, said smoke was beating down on the left as

badly as ever it did. The sighting of some semaphores was difficult, but the smoke did not obscure any colour-light distant for more than a fraction of a second, although sometimes it produced a flickering effect. Polesworth fast line distant was clearly in view for some 6-7 sec. from the left-hand side.

The driver made a steady brake application, reducing vacuum by 9-10 in., and at the point where the home signal was observed at clear from the right-hand side, about 900 yd. from the distant and 375 from the home, the speedometer showed a reduction from 58 to 32 m.p.h. Weather was much the same as on the day of the accident. On neither occasion did a train on another line affect sighting of the distant signals. It can only be concluded that the driver was not keeping a good look-out. His sight was found satisfactory and he was proved to be in good health.

Remarks

The driver failed in his fundamental duty to observe and obey signals and missed a bright colour-light distant at ample distance from the home signals. Diversion from one line to another out of course is an everyday occurrence and safety is entirely dependent on drivers' obedience to signals.

When diversions are pre-arranged, a driver is reminded before leaving the shed, but cannot be informed when they are made at short notice. Turnout derailments resulting from failing to obey signals have occurred before. The accidents at Bourne End, 1945, and Goswick, 1947, are recent examples. Casualties were heavy and might have been in this instance. Speed and circumstances were much the same in all three cases. Probably the platform prevented this one from being equally serious.

This accident demonstrates again the value of automatic train control of warning type, which would in all probability have prevented the others mentioned. There is little doubt that it would have prevented this derailment and almost certainly the cases at Brentwood in 1941, Ilford in 1944, and Gidea Park in 1947. In each there was considerable loss of life. In its annual report for 1948, the British Transport Commission accepted in principle the desirability of extending this control, but neither the long-used G.W.R. system nor the form introduced on the Southend line of the former L.M.S.R. in 1947 was considered suitable for general adoption with semaphore and multi-aspect signalling, steam and electric traction; extensive experiments were therefore put in hand by the Railway Executive to develop apparatus to meet all modern requirements. These are still continuing and it is to be hoped that finality in this matter soon will be reached.

CINEMA COACH IN NORTH EASTERN REGION.—Some 600 members of the North Eastern Region Civil Engineering Department, York, recently visited British Railways cinema coach. Fourteen shows were given in York, and each performance consisted of five films lasting a total of approximately two hours. The films which are on track maintenance, show the latest methods and describe mechanical appliances to speed up the work and reduce the manual effort required. In all, 3,500 men of various grades in the North Eastern Region are expected to attend the mobile cinema.

Passenger Fare Alterations

Annulment of standstill order of April 15

A revision of fares in the London Area, both on British Railways and on London Transport railway and road services, took effect on March 2, 1952. It involved *inter alia*: (*a*) on British Railways (other than the L.T.S. Line), reduction of ordinary fares from 2·44d. to 1·75d. a mile, abolition of monthly return fares, and increase in season ticket rates of about 20 per cent.; (*b*) on British Railways L.T.S. Line (Eastern Region), increases in the ordinary fare from 1¼d. to 1½d. a mile and in season ticket rates of about 20 per cent.; and (*c*) on London Transport services, increases in ordinary rail and road fares from 1¼d. to 1½d. a mile and in railway season tickets by about 20 per cent. Outside the London Area, British Railways third class ordinary fares were reduced from 2·44d. to 1·75d. a mile from May 1. An increase of about 20 per cent. in British Railways season tickets outside the London Area, due to take effect from May 1, was postponed by the standstill order issued by the then Minister of Transport, Mr. J. S. Maclay, on April 15. Subsequent dissatisfaction expressed by London travellers was increased by the fact that they were subject to the higher charges while those in the provinces have continued to pay the previous rates.

On April 28, the House of Commons approved a motion upholding the decision that disproportionate increases should not be applied to passenger charges outside the London Area and agreeing that means should be sought of applying the same principle so far as practicable to rail and omnibus fares already introduced within the London Area. On June 16, Mr. A. T. Lennox-Boyd, Minister of Transport, announced that modifications would be made in the increased passenger charges which were brought into force in the London Area on March 2, and those which it had been proposed to bring into force outside that Area on May 1. Discussions had taken place with the British Transport Commission. It was hoped to bring the modified charges into force in the London Area on August 31 and outside that Area on September 1.

The Ministry of Transport issued a statement on August 14 to the effect that the B.T.C. had informed the Minister that it was ready to give effect as from August 31 to modifications in bus and rail fares in the London Area in accordance with his statement to the House of Commons on June 16, and to introduce on September 1 appropriately modified increases in certain railway passenger fares outside the London Area, as outlined in that statement. The Minister had accordingly directed that the standstill direction issued by his predecessor on April 15 should cease to have effect.

"Under the Passenger Charges Scheme confirmed by the Transport Tribunal on February 27," the statement continues, "the Commission was authorised to make certain increases in passenger charges in the London area from March 2 and outside that Area from May 1. The scheme allowed discretion to the Commission in regard to certain fares and, in the opinion of the Government, the manner in which the Commission had exercised, or proposed to exercise, this discretion would have imposed disproportionate hardship in some cases." This was the reason for the standstill order of April 15 and for Mr. Lennox Boyd's statement in the House of Commons on June 16.

The modifications referred to, the Ministry statement explains, relate to substandard and concession fares and will give effect to the House of Commons resolution of April 28. On the road services of London Transport they include the restoration of the stages in operation before March 2. Examples of altered third class fares are given in the accompanying tables.

The main features of the modifications are:—

British Railways Outside London Area

Ordinary single and return fares: Most ordinary fares will remain unchanged on the reduced basis of 1¼d. a mile. Some which are abnormally low will be increased. Fares reduced last May will not be increased.

Early morning return and workmen's fares: The cheap early morning return fares will replace workmen's fares, which will be withdrawn. They will cost rather more than the workmen's fares which they replace, but considerably less than ordinary return fares. Early morning return tickets are normally available for journeys finishing by 8.0 a.m. In cases where workmen's tickets are issued for journeys finishing later than 8.0 a.m., early morning return tickets will be issued to cover these later arrivals, not beyond 8.30 a.m.

Cheap day return and excursion fares: Cheap day return and excursion fares will be continued with little change.

Season ticket rates: Season ticket rates will be increased by varying amounts, generally not exceeding 20 per cent. There will be a very small number of cases—for example, where very short distances are involved—in which increases will be more like 30 per cent.

Distances and alternative routes: Fares will normally be based on the distances travelled, *i.e.*, travel by a longer alternative route will usually cost more than the direct route. Certain alternative routes, however, may be used without extra charge.

LONDON TRANSPORT RAILWAYS

From	To	Before March 2	Now	Will be
		s. d.	s. d.	s. d.
Ordinary Single				
Oakwood	Southgate	1½	3	2
Queen's Park ...	Paddington	3	5	3
Aldgate	Baker Street	5	8	6
Eastcote	Aldgate	1 6	1 11	1 9
Early Morning Return				
Mile End	Charing Cross	7	11	9
Quarterly Season				
Morden	Tottenham Court Road ...	90 6	117 0	108 9
Hounslow West ...	Blackfriars	120 3	157 6	144 6

Shift workers' tickets: Shift workers' facilities will be continued on the present basis, but at the level of the early morning return fare.

Inside London Area

LONDON TRANSPORT SERVICES

General: Certain ordinary and early morning fares and season ticket rates which were below the standard level before March 2, and were subsequently increased on the authority of the Transport Tribunal are to be reduced on London Transport road and rail services as from August 31. While the number of these sub-standard fares and rates is considerable, the B.T.C. emphasises that the fare reduction is not a general one, and that the majority of London Transport fares at present in force will be unchanged. Those affected are the road and rail ordinary fares and rail early morning return fares and season ticket rates which were increased by more than the general increases from the old scales to the new, when fares were revised on March 2. They are now to be reduced so that they bear no more than the standard increase.

Ordinary fares: Examples of the reductions in sub-standard road and rail ordinary single fares, where they were raised on March 2 by more than the standard amount, are as follows:—

Before March 2, 1952	Present fare	Reduced on August 31 to
d.	d.	d.
1½	3	2
3	5	3
4	6	5
5	8	6
6½	9	8
8	11	9

Fare stages: On the road services the fare changes referred to above will involve the restoration of those fare stages which were shortened. Stages which were abnormally long for the fare charged prior to March 2 were shortened at that date to conform to the standard generally applied and to give a more uniform distance over all routes for the fare charged. These fare stages are now to be lengthened again to cover the same points and distances as they did before March 2.

Early morning return fares: On London Transport railways, comparable changes will also be made in early morning return fares where these were, for similar reasons, increased by more than the standard amount.

Season tickets: Certain sub-standard season tickets were raised on March 2 by a percentage greater than the standard increase of approximately 20 per cent. applied to season ticket rates. In these cases, the season ticket rates will be reduced so that they bear no more than the standard increase. In cases where sub-standard monthly and quarterly season tickets are in force between dates overlapping August 31, arrangements will be made to make a proportionate refund in respect of the difference in rates for the period from August 31 to the expiry date.

BRITISH RAILWAYS

Inside London Area

Region	Ticket	Miles	From	To	Before March 2	Now	Will be
					s. d.	s. d.	s. d.
Southern ...	Single	14	Hounslow ...	Waterloo ...	1 4	1 10	1 7
	Early morning ...	14	Hounslow ...	Waterloo ...	1 7	1 11	1 11
	Quarterly season ...	14	Hounslow ...	Waterloo ...	124 3	149 3	149 3
Eastern ... (L.T.S.)	Single	33	Fenchurch St. ...	Leigh ...	3 6	4 2	4 2
	Early morning ...	33	Fenchurch St. ...	Leigh ...	2 9	2 10	3 4
	Quarterly season ...	33	Fenchurch St. ...	Leigh ...	210 9	252 6	252 6

Outside London Area

Region	Ticket	Miles	From	To	Before May 1	Now	Will be
Eastern ...	Single	30	Liverpool St. ...	Chelmsford ...	4 4	4 5	4 5
	Early morning ...	30	Liverpool St. ...	Chelmsford ...	2 7½	2 7½	3 2
	Quarterly season ..	30	Liverpool St. ..	Chelmsford ..	191 3	191 3	206 6

Shift workers' tickets: Shift workers' facilities on London Transport railways are to be restored.

BRITISH RAILWAYS IN LONDON AREA

General: Early morning fares and season ticket rates (other than those for traders' seasons) which were sub-standard and were increased on the authority of the Transport Tribunal by more than about 20 per cent. on March 2, 1952, will be reduced by varying amounts as from August 31, to conform with the approved increases in standard charges.

Shift workers' tickets: Shift workers' facilities which were withdrawn on March 2 on the authority of the Transport Tribunal, are to be restored, but at the level of the early morning return fare.

Demolition of Doe Lea Viaduct

The line from Chesterfield Market Place Station to Shirebrook North was closed to passenger traffic on December 1, 1951, and the Bolsover Tunnel entrances were bricked up. Doe Lea Viaduct which carried this line immediately west of Bolsover South Station is to be demolished to permit the National Coal Board to mine freely at this point without risking subsidence.

A firm of contractors is removing timber shoring used in the past to strengthen the viaduct. It will also salvage several wagon loads of blue surface bricks. The disposal of the timber and bricks is expected to do much to defray the cost of the demolition.

The viaduct is to be blown up at 8 a.m. on Sunday, August 24, and a specialist firm of explosive experts will undertake this work. Over 200 lb. of high explosives will be placed in a complex system of charges in the arches and piers to enable the viaduct to be demolished in one operation.

A colliery railway serving Glapwell pit passes under one of the arches of the viaduct at right angles to it, and the demolition operation has been so timed that this line, which is to be closed the evening before and suitably protected, may be reopened to traffic on the Monday morning without interfering with output.

The viaduct is 370 ft. long and 29 ft. wide. It has eight spans and is 70 ft. high. It has been a local landmark since the line was opened on March 8, 1897, when it formed part of the former Lancashire Derbyshire & East Coast Railway from Chesterfield to Lincoln.

International Association for Bridge & Structural Engineering Congress

On August 25, the fourth congress of the International Association for Bridge & Structural Engineering will open in Cambridge. The congress will occupy two weeks, of which the second will be spent in London. This is the first congress of the Association to take place in this country; previous meetings since 1929, when the Association was founded, have been in Paris, Berlin, and Liège.

The President of the Association, who, by agreement, is always a Swiss, is Professor Dr. F. Stüssi. There are four Vice-Presidents, representing Great Britain, France, Belgium, and Sweden. The British representative is Mr. Ewart S. Andrews, Past-President of the Institution of Structural Engineers, who is the President of the Organising Committee of this year's Congress. Of the £19,000 which the Congress is estimated to cost, £15,000 will have to be subscribed. Associations and firms have made generous contributions, but further help is invited.

The 53 papers are grouped into six subjects—two concerning metal structures and reinforced concrete structures, and two for each of the two methods of construction. A working meeting of the Congress will be devoted to each subject, for which there is a general reporter. The papers are contained in a volume to be presented at the Congress.

Among papers of railway interest are: "The influence of erecting methods on design of steel bridges," by Mr. H. Shirley Smith, Director, Cleveland Bridge & Engineering Co. Ltd.; "Partially prestressed concrete construction built in the Eastern Region of British Railways, 1948-52," by Dr. P. W. Abeles, British Railways; and "Corrosion of reinforced concrete in bridges and structures on railways," by Messrs. Boutron and Séméac, of the French National Railways.

Twenty-seven nationalities are represented at the Congress, and some 500 members and their ladies are expected to attend. British railway officers who have been invited, as private members or representing the British Transport Commission, which is a member, include Messrs. L. E. Hawkins, Assistant Civil Engineer (Structures), London Transport Executive; P. S. A. Berridge, Bridge Assistant, Western Region; W. P. S. Cockle, Principal Executive Assistant (New Works), London Transport Executive; and Dr. P. W. Abeles, Civil Engineers' Department, Eastern Region.

A visit will be made during the first week to the British Welding Research Station. During the second week members will be able to choose from a selection of visits and excursions. There will also be a Government reception and a banquet at the Guildhall, London.

Signalling & Interlocking Standards Committee, India

Visits to installations and works

The twenty-fifth meeting of the Signalling & Interlocking Standards Committee, India, was held in Calcutta earlier this year. The subjects on the agenda included consideration of mechanical signalling parts, standards of signalling systems, and electrical signalling apparatus.

Visits were made to the works of Guest, Keen, Williams Limited, Saxby & Farmer (India) Limited, and the India Electric Works (Instruments Section). At the works of Guest, Keen, Williams Limited, the work of casting, drop forgings and the manufacture of parts for permanent way equipment was inspected. The Committee saw the part of the works devoted to the manufacture of nuts and bolts by the hot and cold process, involving the use of many modern automatic machine tools.

At the works of Saxby & Farmer (India) Limited, the Committee inspected double-wire signalling equipment being manufactured for the Kandla-Deesa extension of the Western Railway. Some of the interlocking frames were nearing completion and being interlocked. A demonstration model of centralised traffic control equipment was examined in detail.

The instrument section of the India Electric Works at Entally originally manufactured telephone apparatus and manually-operated switchboards of the cord and cordless types. In recent years it has turned to the production of Morse keys, sounders, relays, and other equipment for telegraph circuits. It also manufactures ancillary signal equipment, such as light and arm repeaters, circuit controllers, and electric reversers and train lighting equipment.

Howrah Power Signalling

The power signalling installation at Howrah (Calcutta) was inspected. The original equipment, installed about 1905, consisted of a 43-lever mechanical frame for working the junction between the Bengal Nagpur and East Indian Railways, and a 71-lever "B" type Westinghouse power frame at Howrah; this operated points and signals electro-pneumatically. Not only was this the first power installation in India but it was installed at the same time as the Westinghouse electro-pneumatic and automatic signalling on the electrification of the District Railway and the newly-constructed tube railways in London. The Howrah signalling was replaced in 1936 by a modern cabin containing an 82-lever power frame, electrically interlocked with locks of the forced-drop type. A light indicator is provided over each lever to show when it is free to be moved.

Running signals are of the three-aspect searchlight type while subsidiary signals are of doublet lens showing yellow and red. Points are worked by 110-V. d.c. machines; where derailing switches are in use they are coupled to the co-acting points by means of rodding. Direct current power for the point machines is obtained from a battery of 55 Chloride cells on trickle charge, the main supply is 400-V. a.c. single-phase, 50 cycles, transformed down to the standard signal operating voltage of 110. All running lines are track circuited throughout. The power frame, point machines and signalling apparatus were supplied by the then General Railway Signal Company of London, now Metropolitan-Vickers—G.R.S. Limited.

Those who attended the meeting were:—

Messrs. H. C. Towers, Chairman, Chief Signal & Telecommunications Engineer, Western Railway; C. A. White, Chief Signal & Telecommunications Engineer, Southern Railway; W. Duncan, Deputy Chief Engineer (Signals), Central Railway, Bombay; B. C. Basu, Deputy Chief Engineer (Signals), Bengal-Nagpur Railway, Calcutta; J. A. Meneze, Deputy Chief Engineer (Signals), East Indian Railway, Calcutta; P. S. Bennett, Signal Engineer, Oudh Tirhut Railway; S. M. Gowrishanker, Executive Engineer (Signals), Eastern Punjab Railway, Delhi; M. M. Agerwala, District Signal Engineer, Assam Railway, Pandu; V. Venkatramayya, Deputy Chief Controller (Civil), Central Standards Office; and L. C. Mohindra, Assistant Deputy Chief Controller of Standardisation.

Train Cruise in North Wales

The popularity of the Festival Land Cruise inaugurated last year in the North Wales area of the London Midland Region from Rhyl, has prompted the introduction of another cruise train this season from and to Llandudno, traversing the same route as that taken by the cruise from Rhyl.

Leaving Llandudno at 9.55 a.m. daily (Mondays to Fridays inclusive) the train calls *en route* at Deganwy, Llandudno Junction, Colwyn Bay and Abergele, and then passes through Rhyl to Corwen *via* Denbigh. It then follows the former Cambrian route (now part of the Western Region) *via* Bala and Dolgelley to Barmouth where a stop is made for about 1½ hr.

The journey is resumed *via* Harlech and Portmadoc to Afonwen where the train re-enters the London Midland Region and takes the branch through Caernarvon to Bangor, returning along the coast to Llandudno.

The total distance covered is 158 miles, of which 114 are over single track, requiring careful timing. The maximum height reached is 770 ft. at Drws-y-nant, about eight miles before reaching Dolgelley. The train, formed of six vehicles with a carrying capacity of 190 passengers is drawn by a class "3" 2-6-2 tank locomotive, to Rhyl where a class "2" 2-6-0 locomotive takes over for the remainder of the round trip which involves several sharp curves and severe gradients. London Midland Region train crews work the train throughout with an additional pilot over the Western Region section of the route.

Saloon-type Rolling Stock

The coaches consist of a modern open third and open third brake, a club saloon, two semi-royal saloons and a saloon brake with a corridor gangway door at one end only; the last-mentioned vehicle was formerly part of the "Coronation Scot" train which spent the war years in the United States.

The saloon-type vehicles have wide windows suitable for viewing the scenery and comfortable movable armchairs. There are adequate toilet and washing facilities throughout the train. Two of the saloons have small pantries from which Hotels Executive staff serve light refreshments, ices, and minerals.

A fare of 13s. is charged for the tour, which affords views of some of the finest scenery in Great Britain. A strict ticket regulation scheme ensures a seat for everyone, but no reservations, except for large parties are made. On joining the train each passenger is given a pamphlet briefly describing places of interest on the journey and a map indicating the route to be followed. A guide well versed in Welsh history and lore travels in the train.

The accompanying illustration shows the following London Midland Region officers on the train: (left to right) Messrs. W. B. Shelton, Divisional Operating Superintendent, Crewe; S. G. Hearn, Operating Superintendent; and F. H. Fisher, District Traffic Superintendent, Chester. Mr. Dickenson, Stationmaster, Llandudno Junction (standing) acts as guide.

Officers of the London Midland Region in the North Wales cruise train

Trials of a New Monorail in Germany

Near Cologne some 80 engineers have been working under the aegis of an American consortium on a new type of monorail system, which, it is claimed, will allow speeds up to 350 km.p.h. (about 218 m.p.h.) to be attained. The project is backed by a Swedish-American financier.

The first trial runs are expected to begin shortly on an oval-shaped line of about 1¼ miles, at Fühlingen. The track will be formed of a reinforced concrete trough carried on short pylons. The coaches, which German firms are building, will be suspended at their centres of gravity and overhang the track at each side, in a manner somewhat similar to that of the former Lartigue monorail cars between Listowel and Ballybunion, in Ireland. They will be streamlined and built of aluminium alloys; electric or diesel power will be used. Instead of flanged wheels they will be provided with a form of roller running on the top of the concrete beam, the overlap of the body ensuring stability.

One of the principal claims for the invention is the saving in material compared with what is needed for a conventional railway of like capacity. Special signalling and automatic train control arrangements will be provided, and it is suggested that trains maybe operated from a central control point. The promoters expect that the system will particularly attract countries, such as Africa and Australia, where lines have still to be built to connect remote territories.

The test track has curves and gradients such as would be met with in practice and speeds up to some 100 m.p.h. are to be experimented with. A much longer test line is under construction in the Eifel district; on it speeds from 300 to 350 km.p.h. (186 to 218 m.p.h.) are to be attempted.

Staff & Labour Matters

Railway Unions' Claim

The claim of the N.U.R., A.S.L.E.F. and T.S.S.A. for a 10 per cent. increase in rates of pay and enhanced payment for time worked after noon on Saturdays is to be heard by the Railway Staff National Tribunal under the chairmanship of Sir John Forster, beginning on October 6. The claim was declined by the Railway Executive at a meeting of the Railway Staff National Council on July 28.

Engineers' Wage Claim

At the annual conference of the Confederation of Shipbuilding & Engineering Unions last week, delegates approved the emergency resolution of the C.S.E.U. executive council which proposed new talks with the employers after rejection of the claim for an increase of £2 a week. A conference of the unions affiliated to the C.S.E.U. has been fixed for September 10 to hear the result of discussions with the employers, whose representatives agreed to discuss the matter today with the C.S.E.U.

The conference approved a resolution that it was the responsibility of the unions to demand pay increases and improve real wages.

The employers are to be asked to consolidate existing basic rates and bonuses and to agree to a minimum for piecework which would ensure earnings one-third greater than the new basic rate; this also would apply to railway shopmen. The resolution demanded higher pay for apprentices and equal pay for women. The unions also desire consultation between managements and shop stewards on overtime and increased overtime pay.

Contracts & Tenders

The Crown Agents for the Colonies have placed a contract with G. R. Turner Limited for 35 all-steel bogie low-side wagons, and 25 underframes and 40 spare bogies, for the Sierra Leone Government Railway.

The Indian Government has placed the following contract under its 1953 programme:—

S.A. La Brugeoise et Nicaise & Delcuve, Belgium: 975 broad-gauge underframes without wheels and axles.

The Pakistan Government has recently placed contracts with Groupe Français, Paris, for petrol tank wagons and covered goods wagons. The firms who will build the rolling stock are as follows:—

Cie Francaise de Materiel de Chemins de Fer: 200 metre-gauge four-wheel covered goods wagons, type "MCJ."

Etablissements Fauvet-Girel: 162 broad-gauge oil tank wagons, type "TO."

Cie Generale de Construction: 200 metre-gauge four-wheel covered goods wagons, type "MCJ."

Ste. Lorraine des Anciens Etablissements d Dietrich et Cie de Luneville: 200 metre-gauge four-wheel covered goods wagons, type "MCJ."

Contracts have also been placed by the Pakistan Government as follows:—

Ansaldo, S.A., Genoa-Cornigliano, Italy: 80 metre-gauge brakevans, "MBVG" type; 140 "CMR" type cattle wagons.

S.A. des Anciennes Usines Canon-Legrand, Jenappes-lez-Mons, Belgium: 1,507 "CR" type cattle wagons.

Reference was made in our July 4 issue to contracts for diesel-mechanical shunting locomotives recently placed by British Railways, Eastern Region. Apart from the three 200 h.p. 0-6-0 engines for Wisbech, mentioned previously, the Drewry Car Co. Ltd. has orders in hand for three diesel locomotives for use at West Hartlepool, North Eastern Region, and three for Parkeston Quay, Eastern Region. These six locomotives are under British Railways 1952 and 1953 building programmes, respectively, and are in addition to an earlier four, which have already been delivered by the Drewry Car Co. Ltd.

The following contracts have been placed by British Railways, London Midland Region:—

Leonard Fairclough Limited, S.W.1: new permanent way drainage between 54¾ and 55¾ mileposts on the London to Rugby line.

Robertson Building Service, H. H. Robertson Company, Wirral: removal of roof coverings over platforms nos. 4 and 5 at Preston Station and re-covering with protected metal "V" beam sheeting.

W. H. Heywood & Co. Ltd., Huddersfield: new roof coverings of patent glazing over platforms nos. 4 and 5 at Preston Station.

F. Bradford & Co. Ltd., N.18: reinforced concrete barrel vault shell roof, flat roofs, suspended floors and staircases for the new road motor depot, St. Pancras Way, N.W.1.

International Development Co. (Nottingham) Ltd., Newark: provision of additional rail facilities at Oakleigh Sidings for the I.C.I. Winnington & Wallerscote Works, Northwich.

Dorman Long & Co. Ltd., Middlesbrough: supply and erection of steelwork for the goods terminal at Liverpool Huskisson (C.L.C.) depot.

W. Bush & Son Ltd., Alfreton: removal of Buckley Hill sidings at Milnrow, near Oldham.

Notes and News

Vacancy for Foreman Platelayer.—A foreman platelayer is required for a West African contract. See Official Notices on page 223.

W. H. Smith & Son Ltd. Bookstall Contract Renewed.—W. H. Smith & Son Ltd., has renewed for 21 years its bookstall contracts with the London Transport Executive.

Vacancy for an Assistant Engineer.—Applications are invited for the position of an assistant engineer to Western Welsh Omnibus Co. Ltd See Official Notices on page 223.

Retired Railway Officers' Society.—The autumn luncheon of the Retired Railway Officers' Society will be held on Tuesday, November 4, at the Criterion Restaurant, Piccadilly Circus, at 12.30 for 1 p.m.

The Central Engineering Co. Ltd.—On and after August 25 the address of The Central Engineering Co. Ltd., will be Colquhoun House, 27-37, Broadwick Street, London, W.1. The telephone number will be Gerrard 9641-8.

Record Orders for J. Stone & Co. (Holdings) Ltd.—Mr. Kenneth Preston, Chairman of J. Stone & Co. (Holdings) Ltd. has stated that although during the last few months there has been a reduction in the rate at which new orders have been obtained, the value of unexecuted orders of the group now stands at over £11,000,000—a record. He adds that he can see no reason why the results for the current year should not be at least equal to the current figures. The total profit for 1951 was £1,327,480, an increase of £29,023, and the group balance before tax £1,115,470, against £1,125,918 for the preceding year.

East Indian Railway Dinner.—The 1952 annual dinner of the East Indian Railway Officers' Association, the 49th in the series, will take place at the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2, on Wednesday, September 24. The chair will be taken by Mr. G. A. R. Trimming. It will be followed on Thursday, September 25, by the annual re-union tea-party at the St. Ermin's Hotel, Caxton Street, S.W.1. Full details of both functions may be obtained later from the Honorary Secretary, Mr. R. C. Harvey, whose address during office hours is Messrs. Rendel, Palmer & Tritton, 125, Victoria Street, S.W.1. ('Phone VICtoria 8494, extension 102.)

Lord Hurcomb in Northern Ireland.—Lord Hurcomb, Chairman of the British Transport Commission, accompanied by Mr. John Benstead, Deputy Chairman; Mr. F. A. Pope, Member, and Messrs. H. P. Barker and John Ryan, Part-time Members of the Commission, arrived in Northern Ireland on August 13 on a two-day visit. The party inspected activities of the Ulster Transport Authority, particularly the workshops at Duncrue Street, and production

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of the six-coach multi-engined diesel trains, the first of which is in service on the Belfast-Bangor section.

Pacific Locomotive Named "Princess Anne."—British Railways, London Midland Region, locomotive No. 46202, which has just been converted from a turbine to a four-cylinder reciprocating engine of the "Princess" class, has been named *Princess Anne*.

Closing of London Midland Region Stations.—On September 1 Worleston Station, between Chester and Crewe, London Midland Region, will be closed for passengers, parcels, passenger train merchandise, and freight traffic (except coal). On the same day Norton Station (between Helsby and Warrington) will be closed for passengers, parcels, and passenger train merchandise.

Section of Stanmore Branch, L.M.R. to Close.—Stanmore Village Station, the terminus of the London Midland Region branch from Harrow & Wealdstone will close on September 15 for passengers, parcels, and passengers train merchandise. Parcels and passenger train merchandise will be handled at Harrow & Wealdstone. The line will remain open for all traffic between Harrow and Belmont.

Improvements at Northampton Motive Power Depot.—The London Midland Region is to install mechanical coaling and ash removing plants, a new water storage tank of 70,000 gal. capacity, and four water columns at Northampton Motive Power Depot. The storage tank will be in two sections to enable repairs and cleaning to be undertaken without interrupting the water supply. It is expected that work will begin at the end of September. Seventy locomotives arrived at the shed daily for coaling.

Importance of Steel Supplies to Engineering Industry.—The Chairman of Ruston & Hornsby Limited, Mr. W. J. Ruston, in his statement accompanying the report for the year ended March 31, 1952, has said that if only adequate steel supplies could be made available to the engineering industry, that industry alone could go a long way towards resolving national financial difficulties. The basic difficulty, he states, is the shortage of supplies of both carbon and alloy steel; not only are the authorisations by the Government below requirements to meet productive capacity, but the company is finding great difficulty in persuading the steelmakers to accept orders and deliver the steel against the paper authorisations which have been granted. Ruston & Hornsby Limited, he points out, has capacity for much greater production. The firm has a record order book, and the necessary labour, but cannot at present take advantage of this, mainly because of shortage of steel.

The San Paulo Railway.—Now that the cash position of San Paulo (Brazilian) Railway has improved by the receipt of the recently announced remittance of £379,044 from Brazil, the board is of opinion that it can justify to the High Court a further return of capital. The Chairman has said that the company's auditors in Sao Paulo are preparing a statement of the position there for inclusion in the Board's petition to the High Court. When it has been received stockholders will be summoned to an extra-ordinary meeting to sanction the capital repayment proposals. The accounts for 1951 show an excess of expenditure over recipts in Brazil of £5,995, to which is added administration expenses in England of £21,436, less receipts of £1,004, leaving a debit balance of £26,426. Including the balance of £246,080 brought in, interest on deposit with bankers, etc., the sum available is £256,385. After deduction of the debit balance, the amount carried forward is £229,959.

British Railways Coal, Iron and Steel Carryings. — British Railways carried 145,595 tons of iron and steel during the week ended August 9, which was an increase of about 10,000 tons over the corresponding week last year. Coal cleared by rail during the week ended 6 a.m., Monday, August 18, was 2,791,780 tons.

Head, Wrightson Results.—For the year ended April 30, 1952, the directors of Head, Wrightson & Co. Ltd., have proposed a final ordinary dividend of 7½ per cent. (5 per cent. for the previous year), making a total distribution of 12½ per cent. (9 per cent.). Group gross profits for the year amounted to £667,749 (£678,448). After providing for depreciation of £80,278 (£87,510,), writing off investments, £22,297 (nil) and charging £310,350 (£345,500) for taxation, group net profits were £254,824 (£244,438).

Luncheon to N.E. Region Railwaymen Holding Civic Offices.—On August 11, Mr. H. A. Short, Chief Regional Officer, North Eastern Region entertained at York five railwaymen who had been elected to civic offices in the Region. The railwaymen were:—

Alderman J. T. Etherington, Mayor of Gateshead (Supervisory Shed Foreman, Gateshead); Alderman N. Garrow, J.P., Chairman of the Northumberland County Council (Goods Guard, Blyth); Alderman F. B. Burnley, Lord Mayor of Leeds (former Chief Clerk, Normanton); Alderman C. W. Wright, J.P., Lord Mayor of York (District Surveyor, York); Councillor G. Wright, M.B.E., J.P., Deputy Mayor of Pontefract (Supervisory Foreman, Pontefract).

General Electric Company Report.—The report for the year ended March 31, 1952, of the directors of the General Electric Co. Ltd., shows that in addition to the interim dividend of 7½ per cent., less tax, a final dividend is recommended of 15 per cent., amounting to 22½ per cent., as paid last year; the proposed final dividend, however, is payable on the increased capital. The satisfactory results for the year are attributed to a considerable expansion of turnover in many products at home and abroad, despite raw material and labour shortages, especially in the earlier part of the year. The year ended with a record in production and a record order book. The demand for the company's wide range of capital goods continued undiminished; exports created a fresh record; and the Overseas Companies had a successful year.

American Car & Foundry Company.—The net earnings of the American Car & Foundry Company and subsidiaries for the year ended April 30, 1952, were $7,202,165, equal after preferred dividend requirements to $8·63 a share on the common stock, against $2,675,914, or $1·08 a common share, for the previous year. Gross sales showed an increase of over 40 per cent. over the preceding year, despite strikes, shortages of materials, rising costs, and other unfavourable factors. Mr. John E. Revensky, Chairman of the board, states that direct taxes for the past year amounted to 143 per cent. of net earnings. Consolidated earnings, after tax, were $7,202,165, compared with $2,675,914 a year before. They would have been even larger, Mr. Revensky explains, but for the necessity of writing off obsolete facilities; but in calculating depreciation, the present Internal Revenue laws do not permit the firm to deduct from current earnings a sum equal to the increasing replacement cost of equipment. "When we eventually replace worn-out equipment," he adds, "we shall have to dip into our capital resources."

Relief Parcels for West Country Flood Victims.—British Railways are accepting for free conveyance up to and including August 23, packages containing articles for relief of victims of the recent floods in the West Country which are so marked and handed in at any passenger or goods station. Packages should be addressed to the W.V.S. Clothing Depot, Newton Abbot, or to the British Red Cross Society, Taunton. The maximum weight for despatch by passenger train is 56 lb., but heavier packages can be sent by goods train.

O.P.P.A. Central Committee.—The committees of the five Omnibus Passengers Protection Associations have set up a Central Committee of their five chairmen with an office at 29, Buckingham Street, London, W.C.2. In notifying the Minister of Transport of the creation of this committee, the Chairman, Alderman W. G. Green Armour, of Liverpool, states that occasions probably will arise when the local knowledge of the committee may be of assistance, or the committee may think it desirable to make representations on behalf of local associations. The committees and sub-committees of the five associations remain in being.

L.M.R. Display for Preston Guild Procession.—A link with the Preston Guild show of 1842 will be part of the British Railways, London Midland Region, display in the procession on September 3. A large scale model of a North Union Railway coach, specially built for the 1842 procession, will be mounted on a lorry. The theme of British Railways display will be behind-the-scenes views of railway working shown by posters on decorated motor and horse vehicles. The Newton Heath Locomotive Works Band will head the contingent, with representatives of various railway grades. One of the vehicles will be drawn by a British Railways prize horse. In addition, Preston station will be decorated for the whole of the period of the Industrial Exhibition.

Powell Duffryn Limited Dividend.—The final dividend for the year ended March 31, on the ordinary stock of Powell Duffryn Limited, is again to be 5 per cent., making 8 per cent. for the fifth consecutive year. The consolidated net profit was £731,686, £126,752 more than for the preceding year, after crediting £51,704 (£72,452 for the preceding year) from taxation reserves, and after charging depreciation of £347,467 (£310,516) and taxation of £1,253,045 (£1,041,460). The consolidated balance to be carried forward is £2,174,673 (against £1,976,407 after transferring to reserve £318,827, the balance of a company liquidated during 1951-52).

Antofagasta (Chili) & Bolivia Railway Co. Ltd. Payment.—The directors of the Antofagasta (Chili) & Bolivia Railway Co. Ltd., announce that a payment of 2½ per cent., less tax, on account of arrears of dividend in respect of the first half of the year 1944 on the 5 per cent. cumulative preference stock will be made on September 19 to stockholders registered September 4, 1952. A similar payment in respect of the half-

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

FOREMAN PLATELAYER required for West African contract. Laying 30 lb. F.B. Track, 30" gauge on wood and steel. Must be competent man, experienced, permanent work, crossings, turnouts, etc. Free accommodation and passage out and home, kit and leave allowance with good salary and bonus on output. Write full details experience, etc., to PAULING & CO. LTD., 26, Victoria Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

WESTERN WELSH OMNIBUS COMPANY LIMITED

ASSISTANT ENGINEER

APPLICATIONS are invited for the position of an ASSISTANT ENGINEER to Western Welsh Omnibus Company Limited. The salary will be according to the qualifications and experience of the successful applicant, who will be required to reside in West Glamorgan or Carmarthenshire. Applications, giving details of age, education, qualifications, experience and salary required, should be marked "Private" and addressed to the GENERAL MANAGER of the Company at Cowbridge Road, Ely, Cardiff, to reach him not later than 30th August, 1952.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

FOR SALE. Hangar (all steel) 113 ft. clear span × 135 ft. long × 25 ft. clear height at eaves, rising to 35 ft. clear at apex. Doors each end (gable optional). Steel Building 111 ft. 6 in. span over frames (101 ft. 4 in. clear) by 216 ft. long by 16 ft. (extensible to 26 ft.) to eaves. Large doors in sides or ends as required. Hangar (all steel) 80 ft. clear span × 144 ft. long × 22 ft. clear height at eaves, rising 32 ft. at apex. Doors one end. Steel building 80 ft. clear span × 144 ft. long × 22 ft. clear height at eaves. Large sliding doors in sides. Curved steel building 35 ft. span × 17 ft. 6 in. high at apex. Up to 600 ft. long (low price).—BELLMAN HANGARS LTD., Terminal House, London, S.W.1.

WANTED "Diesel Railway Traction," May 19, June 16, December 29, 1933; February 23, September 7, October 5, December 28, 1934; April 19, 1935; April 17, 1936. Good prices offered. Write BOX 534, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

year to December 31, 1943, was made last month. After taking into account loss on exchange, interest on the debenture stocks, provision for taxation £658,434 (£291,850), renewals £183,792 (£141,739), contingencies reserve £100,000 (£65,000, and payments of dividend in respect of 1942 and 1943 on the preference, there is a balance on net revenue account for the year 1951 of £448,551 to be carried forward (against £467,264 brought in).

New London Transport Road Services Map.—The London Transport Executive has issued a new road services map which shows both central bus and trolleybus routes on the same sheet. The familiar large-scale inset showing the central area has been doubled, and now extends southwards to Clapham Common.

Purchase of British Road Services Vehicles.—In the official organ of the Road Haulage Association, *The Roadway*, it was stated recently that there is a large number of potential buyers for Road Haulage Executive vehicles to be disposed of under the Transport Bill, and that there is no doubt that the Government would like to see former and existing operators taking up a large share of the nationalised assets offered for disposal. The Association has addressed a questionnaire to all its members as to purchase. Even the delay in the lifting of the 25-mile limit, it is suggested, can be regarded as a strong hint to hauliers to stake a claim in the long-distance field by buying a transport unit. Financing of purchases is mentioned in the questionnaire, which asks whether a loan to assist purchase would be required. At the end of 1951, there were over 912,000 road vehicles with carrier's licences, of which 103,000 were operated under "A" or "B" licences, about 13,000 under contract "A" licences, and 796,000 under "C" licences. These figures do not include nationalised road freight vehicles.

Accident on Loetschberg Railway.—On August 11 a collision occurred on the Loetschberg Railway outside Interlaken between a local train from Bönigen and a goods train. Four passengers were killed.

Normal Services Resumed in Nigeria.—Normal freight and passenger services were resumed in Nigeria on August 15 after eight days' restricted running because of the week's go-slow strike at Enugu collieries.

Courses in Pure and Applied Chemistry.—The Northampton Polytechnic, St. John Street, London, E.C.1, has recently made available its 1952-53 prospectus of part-time day and evening courses in pure and applied chemistry. The autumn term will begin on September 22 and the enrolment of students in attendance during the preceeding session will be on September 15 and 16, and of prospective new students on September 17. Courses are arranged leading to the Associateship examination of the Royal Institute of Chemistry, and the Licentiateship and the Associateship of the Institution of Metallurgists, as well as the higher national certificate course in chemical engineering and courses in fuel technology and metal finishing leading to the examinations conducted by the City & Guilds of London Institute.

Mirrlees Watson Co. Ltd.—The Chairman & Managing Director of the Mirrlees Watson Co. Ltd., Mr. D. M. Semple, stated in his address circulated with the report and accounts for the year ended March 31, 1952, that the company's three works had been kept fully employed during the year. Output had been limited by shortage of material and, in some measure, by lack of skilled labour. During the year orders for condensing and feed heating plants had been received for the British Electricity Authority, the National Coal Board, and for steelworks throughout the country, and they also had on order several condensing plants for Australia. Condensing and feed heating plants were commissioned in power stations in Britain and in South Africa, whilst an installation of large centrifugal pumps was put into service in India.

Courses on Welding Design.—Courses on Welding Design organised by the Quasi-Arc Co. Ltd. have become standard features in London and Bilston where they are held regularly each year. This work is now being extended to other industrial centres and a Course has been arranged for this year in Newcastle. The lectures will be given on Tuesday and Wednesday evenings, over six weeks beginning on October 14, 1952, at Kings College, Newcastle. The instruction concentrates on the needs of Draughtsmen: particular emphasis is placed on the practical factors involved in designing welded structures and the efficient detailing of types of welded structural components. Further details of the course and enrolment forms may be obtained on application to the Constructional Design Department, the Quasi-Arc Co. Ltd., Bilston, Staffs.

Thomas de la Rue & Co. Ltd.—Trading conditions are too fluid, in the opinion of Mr. B. C. Westall, Chairman & Joint Managing Director of Thomas de la Rue & Co. Ltd., to allow of any forecast; Mr. Westall recently presided at the fifty-fifth annual general meeting of the company. There had been, he said, a falling-off of demand abroad and at home since the end of the financial year, but subsequently there had been signs of an improvement in sales, both in the export and home markets. The lifting or amelioration of import restrictions in countries overseas on the one hand, or their imposition or tightening on the other, might have a very considerable effect on the year's results. It was a sad thing that a company's results should no longer depend on the excellence of its products, the wisdom of its maangement, or the energy and enthusiasm of its staff, but on decisions of Governments, both in Britain and overseas. The report and accounts were adopted and a final dividend of 15 per cent., less tax, making 35 per cent. for the year, was approved.

Low-Pressure Reinforced Plastics. — On August 14, an informal meeting was held at the offices of the British Plastics Federation, 47-48, Piccadilly, London, W.1, to discuss the machinery that might be set up within the Federation to cater for firms interested in low-pressure reinforced plastics using glass, asbestos and other fibres. The invitation extended to non-member firms. The proceedings were reported to a meeting of the Executive Committee.

Wickman Limited Exhibits at Olympia.—In our August 1 issue, Wickman Limited which is one of the exhibitors at the forthcoming International Machine Tool Exhibition at Olympia, was referred to as A. C. Wickman, Limited. The boring machines which this firm is to exhibit are Heller, the gear generators Lorenz, and the automatic radial arm tapping machine No. IIR, and not as stated.

C. C. Wakefield & Co. Ltd.—The Chairman of C. C. Wakefield & Co. Ltd., Mr. L. W. Farrow, in his statement circulated with the report and accounts for the year ended December 31, 1951, states that sales at home and overseas were an all time record for the group. However, the year proved to be difficult for trading and prices did not keep pace with increased costs, in consequence of which the trading profit showed a reduction compared with 1950. In some more important markets overseas price increases were not granted until some time after application to the appropriate authorities. Notwithstanding the decreased profits, the directors recommended, having regard to the substantial margins of profit

retained in the business in prior years for such contingencies, appropriations including a final dividend of 27½ per cent., less tax. Although, Mr. Farrow added, the price of petrol might reduce private motoring in Britain, the sales and technical organisation of the group was well equipped to maintain and develop their share of the market, and the volume of the company's sales overseas continues to show expansion.

Railway Students Annual Dinner and Dance.—The annual dinner and dance of the Railway Students' Association will be held at the London Transport (South Kensington) Club, on Wednesday, November 26.

C.N.R. Jasper Park Lodge.—Mr. Donald Gordon, President of Canadian National Railways, has announced that the central building of the C.N.R. Jasper Park Lodge in Alberta, destroyed by fire last July, will be rebuilt and ready for the 1953 season. The opening will take place in June. The rustic character of the former building will be retained, though the final design is not yet known. Work on the new building is expected to be put in hand before the present tourist season closes on September 15.

Retired Railway Officers' Society.—The fifty-first annual report of the Retired Officers' Society, which is for the year ended December 31, 1951, shows that the Society's jubilee year ended with a record membership of 178. The report states that the monthly meetings of the Society were well supported, though neither the annual outing, nor the ladies' tea and musical entertainment attracted the numbers hoped for. The most successful function of the Society was the autumn luncheon which was held on November 13, at which the total number present was 134, including 62 guests.

Brighton Works Centenary Special Trains.—The first of the special trains arranged by the Railway Correspondence & Travel Society to commemorate the centenary of Brighton Works will be run on October 5, leaving Victoria at 10.8 a.m. and the second will be on October 19, leaving at 11 a.m. If there is sufficient demand, a third train will be run on October 26. The trains will be all-Pullman and will run to a 60 min. schedule with a Brighton Atlantic. The programme at Brighton includes visits to the works and shed, and a tour of the Kemp Town branch behind "A1x" class locomotive No. 32636, which is the oldest locomotive on the Southern Region. The cost of the tour is 22s. 6d. and applications, with fees and stamped addressed envelopes, should be made to Mr. R. K. McKenny, 46, Friern Barnet Lane, London, N.11.

Forthcoming Meetings

August 25 (*Mon.*) to September 5 (*Fri.*)—Fourth Congress of the International Association for Bridge & Structural Engineering. First week: Papers at Engineering Laboratory, Cambridge. Second week: Visits from Imperial College Union, South Kensington, London.

August 28 (*Thu.*) & 29 (*Fri.*).—Permanent Way Institution, London Section. Visit to Woodhead New Tunnel Works.

Railway Stock Market

The main feature has been a renewed rise in British Funds, which contrasted with some uncertainty in industrial shares, though the undertone generally was firm and little selling was in evidence. There has been a disposition to await the outcome of the demand for higher wages by the engineering unions, but in the City the view has prevailed that a further rise in the bank rate is improbable without a fresh increase in inflationary trends. The belief seems to be growing that by the end of the year, British Funds may be well above current levels, assuming the bank rate to be unchanged. If the uptrend in the gilt-edged market continues, other sections of markets should respond, because with yields on gilt-edged stocks tending to narrow there would be a tendency to favour leading industrial and other high class securities in other sections showing larger yields. Knowledge that in many industries profits are running well below those of a year ago tends to keep industrial shares in check at present, but many shares still have good prospects of maintaining dividends and seem relatively undervalued in price.

With activity in foreign securities still centred on German and Japanese bonds, foreign rails have again come in for only limited attention. The biggest rise has been in Mexican Central "A" debentures, which have moved up sharply to 76 at the time of going to press, attributed in the market partly to American buying.

Manila Railway debentures reflected profit-taking following their recent rise, the view having now gained ground that an early scheme for dealing with the interest arrears on Manila Railroad bonds now seems improbable, though developments continue to be awaited. Immediately there is any official news the company presumably will inform stockholders. Manila Railway "A" debentures were 80, and the "B" debentures 69, while the preference shares were 9s. 4½d.

Antofagasta ordinary and preference have been steadier at 12 and 54½ respectively. San Paulo 10s. units at 11s. 6d. remained under the influence of the Chairman's annual statement and comments on the latest developments with the company claim for capital expenditure on the railway since 1901.

United of Havana stocks remained quiet, awaiting news from Cuba of any further developments; the 1906 debentures changed hands around 15¼.

A fair amount of selling was reported of Taltal shares which moved down to 15s. Nitrate Rails shares were 19s. Brazil Rail Bonds were quoted at 6½.

There were minor movements in Canadian Pacifics around 64¼ dollars; the 4 per cent. non-cumulative preference were better at £63¼ and the 4 per cent. debentures £76¼. White Pass & Yukon common shares became more active around 12⅝ dollars with the 5 per cent. convertible debentures £47, while there were also dealings around 25 in these debentures "ex" conversion rights, some holders having exercised their right to take up common shares.

Chilian Northern 5 per cent. first debentures have marked 31¼, Costa Rica 6½ per cent. second debentures 28 and Guayaquil & Quito 5 per cent. first bonds around 30½.

As expected, engineering and kindred shares have been quieter because sentiment reflected a general tendency to await the result of the higher wage claims by the unions. Vickers at 45s. 6d. moved higher on balance, Babcock & Wilcox showed strength up to 70s., and Guest Keen at 51s. 6d. regained part of an earlier decline.

Ruston & Hornsby eased to 37s. 3d. after their recent good rise; in his annual statement with the accounts, the Chairman points out that whether the uptrend in earnings will continue depends on steel supplies. Firmness has been shown by T. W. Ward at 71s. 3d., and Tube Investments were favoured around 54s., while Renold & Coventry Chain strengthened to 41s. 9d. John Brown were firmer at 43s. 3d., awaiting the full results and the Chairman's annual statement. Clarke Chapman remained at 52s. 6d., while Ransome & Marles showed firmness at 24s. 3d., awaiting the results.

Shares of locomotive builders and engineers showed steadiness, with Beyer Peacock at 27s. 9d., Hurst Nelson 48s. 6d., North British Locomotive 15s. 10½d., and Birmingham Carriage 32s. Vulcan Foundry were 22s. 6d., Gloucester Wagon 10s. shares 12s. 3d., Wagon Repairs 5s. shares 12s., and Charles Roberts 5s. shares 20s. 3d.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week, or month ended	Traffics for week: This year	Traffics for week: Inc. or dec. compared with 1950/51	No. of week	Aggregate traffics to date: Total 1951/52	Aggregate traffics to date: Increase or decrease
				£	£		£	£
South & Cen. America	Antofagasta ...	800	8.8.52	126,150	+ 9,210	32	4,871,900	+ 1,092,010
	Costa Rica ...	281	June, 1952	c1,452,498	+ c330,908	52	c15,851,340	+ c4,551,217
	Dorada	70	June, 1952	33,098	– 3,445	26	199,714	– 14,046
	Inter. Ctl. Amer....	794	June, 1952	$1,009,607	– $23,367	26	$6,944,168	+ $12,517
	Paraguay Cent. ...	274	8.8.52	G651,652	+ G267,108	6	G2,773,923	+ G850,976
	Peru Corp. ...	1,050	July, 1952	$9,506,000	+ $1,581,000	4	$9,506,000	+ $1,581,000
	,, (Bolivian Section)	66	July, 1952	Bs.16,387,000	+ Bs.3,358,000	4	Bs.16,387,000	+ Bs.3,358,000
	Salvador	100	May, 1952	c153,000	+ c15,000	48	c1,899,000	+ c32,000
	Taltal	122	July, 1952	$2,260,000	+ $470,000	4	$2,260,000	+ $470,000
Canada	Canadian National†	23,473	June, 1952	19,061,000	+ 1,419,000	26	110,335,000	+ 10,582,000
	Canadian Pacific†...	17,037	June, 1952	13,073,000	+ 927,000	26	74,042,000	+ 5,050,000
Various	Barsi Light* ...	167	July, 1952	44,155	– 11,670	17	124,140	– 29,610
	Gold Coast ...	536	June, 1952	266,795	+ 19,579	12	918,158	+ 112,909
	Mid. of W.Australia	277	May, 1952	60,051	+ 4,504	48	637,944	+ 183,863
	South Africa ...	13,398	19.7.52	1,884,833	– 13,056	16	31,064,370	+ 1,309,299
	Victoria	4,744	Apr., 1952	2,010,674	+ 217,273	43	—	—

* Receipts are calculated at 1s. 6d. to the rupee

† Calculated at $3 to £1